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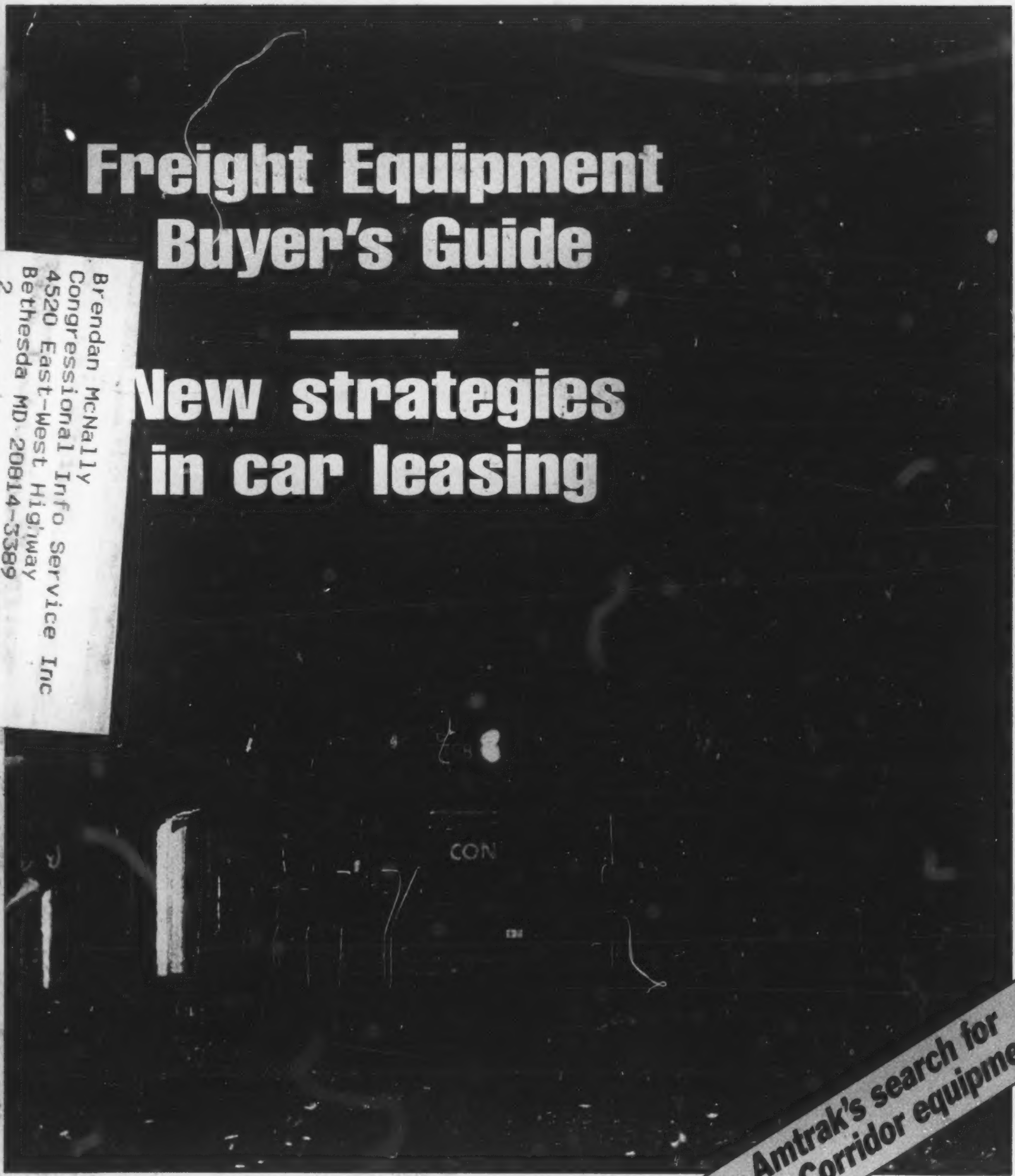
November 1988

Railway Age

...for the new age of railways and rail transit



Freight Equipment Buyer's Guide

New strategies in car leasing

Amtrak's search for new Corridor equipment

Brendan McNally
Congressional Info Service Inc
4520 East-West Higiway
Bethesda MD 20814-3389
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FREIGHT EQUIPMENT BUYER'S GUIDE

FG4 The market gets rolling

Memories of boom and bust are too vivid to allow any complacency among suppliers, but orders are rolling in briskly and the near-future looks good

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Market Outlook

Equipment

American President intermodal: Ordered three 40-long-ton capacity, rubber tired Transtainer stacking gantry cranes from PACECO for use in API's South Kearny, N.J., intermodal yard.

Amtrak: Purchased eight 3,000-hp, four-axle 6P4OTC locomotives from GO Transit, Toronto, for $2.3 million. They will be modified at Beach Grove, Ind., for service on short distance routes in the Midwest, freeing F4OPH locomotives for assignment to long-distance trains where there is a shortage of power.

GO Transit: Ordered an additional six FPH59 diesel-electric locomotives from General Motors of Canada's Diesel Division at a cost of $13.7 million (Canadian). An earlier order for 16 of the locomotives, valued at $36.7 million, has been delivered.

SP-D&RGW: Immediate equipment plans for these two railroads, now operating as a combined system under owner Rio Grande Industries, call for acquisition of 50 new locomotives valued at $60 million for delivery in 1989, an order divided between General Electric and the Electro-Motive Division of General Motors; 80 new double-stack container cars; and 150 new 73-foot center beam flatcars.

Trailer Train: Directors authorized acquisition of $52.2 million worth of cars during the first quarter of 1989—750 wells of 125-ton double-stack equipment, $29 million; 350 units of spine platform cars, $7.2 million; and 500 units of TOFC platforms, $16 million. The board also authorized purchase of 350 second-hand flatcars for the autorack fleet at a cost of $7.7 million. Among orders already placed for next year: 50 five-unit articulated well cars (250 wells) from Thrall Car; 40 five-unit cars (200 wells) from Gunderson; 40 five-unit spine cars (200 platforms) from Trinity Industries; and 10 five-unit spine cars (50 platforms) from Bethlehem Steel.

Facilities

Conrail/Agway: Are investing $8.5 million in a fertilizer unloading facility at Conrail's Pier 122 in Philadelphia. Conrail will spend $4.1 million to modify the pier for additional vessel-unloading operations. Agway, a farm supply and marketing cooperative, will build a $4.4 million storage and distribution terminal.

Dakota, Minnesota & Eastern: Will accelerate the upgrading of 338 miles of track in South Dakota with the help of a $7.8-million, low-interest loan from the Federal Railroad Administration. The program includes insertion of 165,000 new crossties, application of 199,000 tons of ballast, and strengthening or rehabilitation of 75 bridges. The regional carrier has already spent $1.9 million for track improvements in South Dakota since it began operations two years ago. DM&E has a five-year, $20-million track program which includes funding by the FRA, the states of Minnesota and South Dakota, shippers, and the railroad.

Revenue freight carloadings

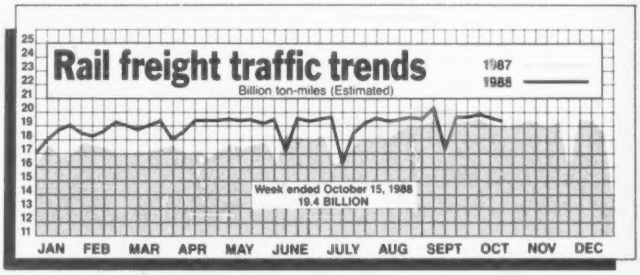
Commodity	Oct. 15 week	Oct.8 week	Oct. 1 week	Sept. 24 week
Grain	31,345	31,739	29,833	30,502
Other farm products	4,029	3,982	3,488	3,252
Metallic ores	22,410	20,257	22,374	20,827
Coal	126,781	128,711	130,874	129,435
Crushed stone, gravel and sand	19,592	19,471	19,911	20,145
Nonmetallic minerals	11,050	11,233	10,948	11,120
Grain mill products	10,577	10,803	11,019	11,103
Food and kindred products	11,744	11,405	11,596	11,192
Primary forest products	10,133	9,441	9,993	9,935
Lumber and wood products except furniture	7,218	6,638	7,940	7,726
Pulp, paper and allied products	11,815	11,657	12,254	11,975
Chemicals and allied products	29,356	28,836	28,593	28,138
Petroleum products	4,916	5,259	5,036	4,977
Stone, clay and glass products	11,474	11,718	12,119	11,610
Coke	5,421	6,109	5,899	5,650
Metals and products	10,092	9,281	11,132	11,160
Motor vehicles and equipment	21,603	21,282	22,918	21,966
Waste and scrap materials	10,068	9,532	10,032	9,690
Forwarder and shipper assn. traffic	2,385	2,575	2,645	2,420
All other carloads	88,246	90,777	93,062	90,422
Total Cars Loaded	**450,255**	**458,706**	**461,666**	**453,245**
% change from previous year	1.9	1.0	1.1	0.2
Estimated revenue ton-miles (billions)	19.7	19.7	20.2	19.8
% change from previous year	2.0	0.3	1.3	1.1

Total:	**1988**	**1987**	**% change**
42 weeks	787.3	738.3	6.6

Piggyback loadings

	Oct. 8 week	Oct. 1 week	Sept. 24 week	Sept. 17 week
Trailers/containers	123,542	127,276	121,770	116,469

Cumulative total, 40 weeks		**% change from 1987**
Trailers/containers	4,417,387	5.7



Source: Association of American Railroads

PATH: Awarded a $13.5 million contract to Perini Construction Co. of Hastings-on-Hudson, N.Y., to build subsurface foundations for an emergency evacuation and ventilation facility at Morton and West streets in lower Manhattan, a project that will cost a total of $45 million.

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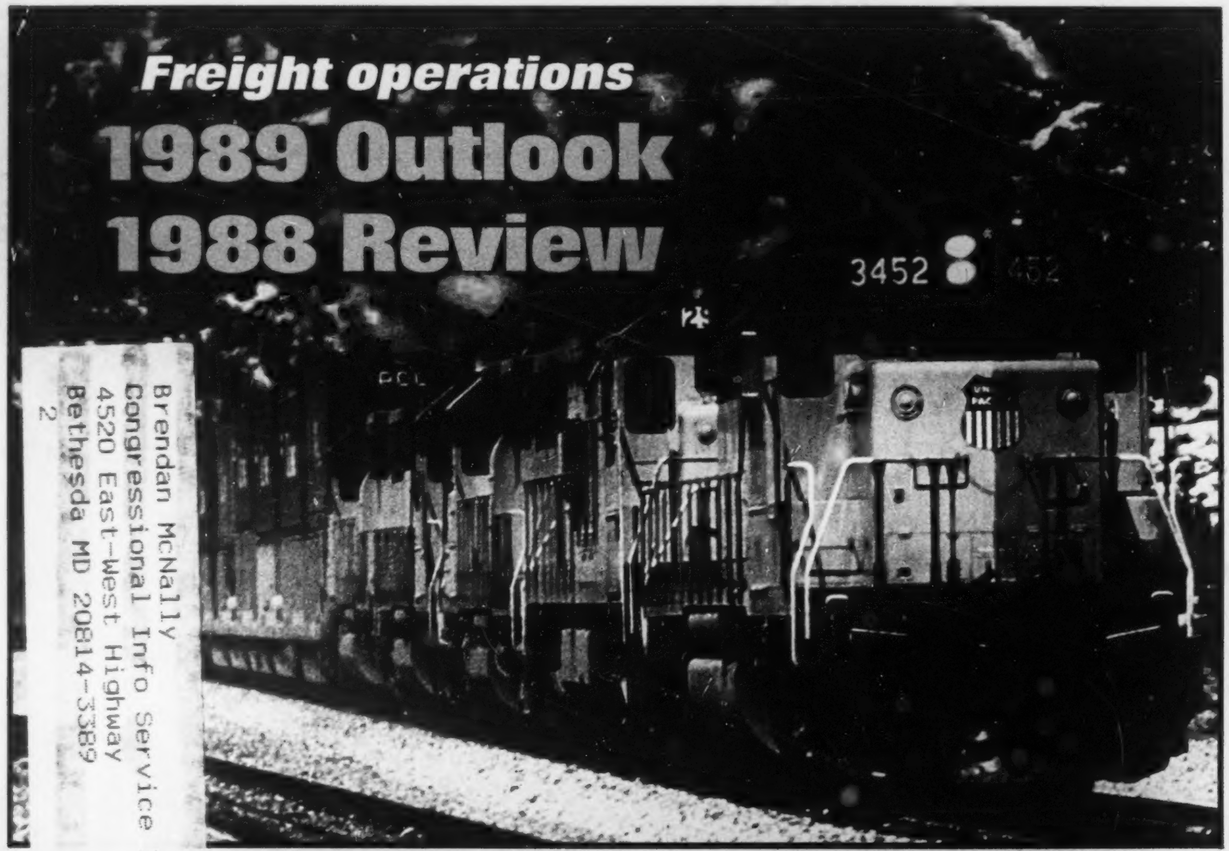

Freight operations

1989 Outlook
1988 Review

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More light rail for Pittsburgh?

Railway Age

December 1988

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23 Comeback—or crisis?

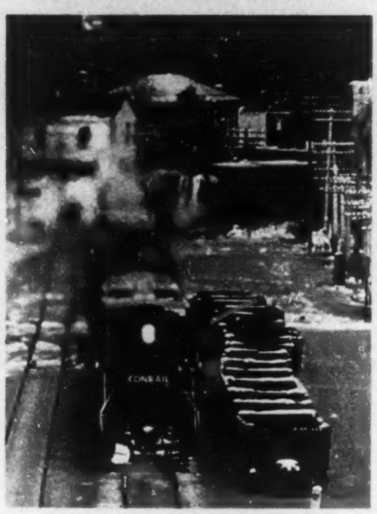
1989's big questions: Will railroads be able to maintain the momentum that brightened bottom lines in '88? And how will they fare in key labor and legislative battles?

27 Winning the numbers game

Almost any way you figure it, the railroads looked good in '88—in traffic, in earnings, in plant and equipment improvements. Best of all, they repelled the reregulators.

30 The 5 toughest questions

Railroad adversaries have a bagful of tricky questions clothed in half-truths. Here are some of the toughest questions you can expect next year, and some answers.



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32 Tri-Rail is ready to roll

Gallery cars are common in the U.S., but the UTDC cars that will go into service next month on Florida's first commuter rail line will be the nation's first true bi-levels.

37 Pittsburgh: More light rail?

In Stage I of a modernization program, PAT brought 10.5 miles of a 26-mile streetcar system up to light rail standards. What happens next is the subject of a study.

43 Wanted: A better wheel profile

The VTS Newsletter describes the ongoing search for "a wheel shape that will reduce wheel and rail wear, and associated energy consumption."

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UP cover photo by Gary J. Benson

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Market Outlook

Equipment

BC Rail: Is assembling 160 73-foot, center beam cars at its Squamish shops from kits supplied by Daewoo of South Korea through Transcisco Industries of San Francisco. BC Rail directors late last year approved expenditure of $10 million (Canadian) for the cars, and Transcisco submitted the lowest acceptable bid. Trancisco's original plan was to assemble the cars at the Miles City, Mont., plant of its subsidiary, Railcar Maintenance Co. (RMC). It was decided to do the work at Squamish in order to keep costs within budget. Assembly is to be completed in March 1989.

CP Rail: Awarded a contract to the Harris Corp. Controls and Composition Division for 25 LOCOTROL II systems to complete replacement of existing LOCOTROL 105 equipment on CP's heavy-haul locomotives in western Canada.

CSX Transportation: Will acquire 2,094 new multi-level cars valued at $70.4 million over a three-year period—644 ordered under the 1988 equipment program; 800 in 1989; and 650 in 1990. Orders for the first 1,444 cars have been awarded to Thrall Car.

Massachusetts Bay Transportation Authority: Awarded a $20-million (Canadian) contract to Bombardier of Montreal to refurbish 18 F40PH diesel-electric locomotives built by Electro-Motive in 1988.

Southern Pacific: Will acquire 50 new diesel-electric locomotives in 1989 at a cost in excess of $50 million—30 3,800-hp GP60 units from the Locomotive Group of General Motors and 20 4,000-hp B40-8 units from General Electric. SP said the new order will supplement more than 150 new or rebuilt diesel locomotives that are being added to the SP/Denver & Rio Grande Western fleet this year. These include 60 new units delivered under a 1987 order, 50 new units being delivered this year on 1988 orders, and 40 rebuilt SP units.

Union Pacific: Ordered 212 new diesel-electric units at a cost of $279 million—106 4,000-hp DASH 8-40Cs from General Electric and 106 3,800-hp SD60s from the Locomotive Group of General Motors.

Revenue freight carloadings

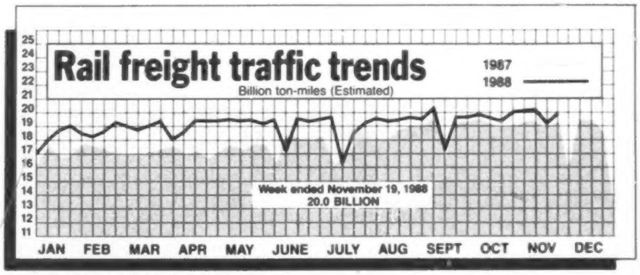
Commodity	Nov. 19 week	Nov. 12 week	Nov. 5 week	Oct. 29 week	Oct. 22 week
Grain	28,738	27,039	31,332	29,038	30,713
Other farm products	4,332	3,766	3,194	3,410	4,168
Metallic ores	20,897	21,103	23,446	25,493	25,107
Coal	133,077	131,263	131,146	125,692	[illegible]
Crushed stone, gravel and sand	17,500	17,312	18,433	19,084	[illegible]
Nonmetallic minerals	9,999	9,888	10,154	10,707	11,072
Grain mill products	10,829	10,794	11,099	10,787	10,949
Food and kindred products	11,333	11,323	11,934	11,674	11,932
Primary forest products	10,325	9,839	9,584	9,589	10,052
Lumber and wood products except furniture	7,247	7,144	7,275	7,951	7,371
Pulp, paper and allied products	11,458	11,163	11,671	11,715	11,281
Chemicals and allied products	29,010	28,251	28,473	28,141	29,003
Petroleum products	5,250	5,142	5,218	5,240	5,215
Stone, clay and glass products	10,846	11,183	11,512	11,630	12,006
Coke	5,478	5,699	5,595	5,970	5,492
Metals and products	9,878	9,935	9,830	10,584	10,075
Motor vehicles and equipment	23,220	24,162	23,277	23,002	22,316
Waste and scrap materials	9,908	9,665	9,793	10,083	10,246
Forwarder and shipper assn. traffic	2,305	2,291	2,585	2,515	2,422
All other carloads	90,188	88,234	91,143	91,982	88,678
Total Cars Loaded	**451,818**	**445,196**	**456,694**	**454,287**	**454,167**
% change from previous year	1.9	2.7	2.5	0.8	3.2
Estimated revenue ton-miles (billions)	20.0	19.9	20.2	20.1	20.0
% change from previous year	1.8	2.5	2.3	0.5	1.7

Total:	**1988**	**1987**	**% change**
46 weeks	887.4	836.7	6.1

Piggyback loadings

	Nov. 12 week	Nov. 5 week	Oct. 29 week	Oct. 22 week	Oct. 15 week
Trailers/containers	123,620	124,071	125,498	118,977	121,041

Cumulative total, 45 weeks		**% change from 1987**
Trailers/containers	5,030,807	0.0



Source: Association of American Railroads

Freight cars

	DELIVERED		ORDERED		ON ORDER AND UNDELIVERED	
	3rd quarter 1988	3rd quarter 1987	3rd quarter 1988	3rd quarter 1987	Oct. 1 1988	Oct. 1 1987
Built new by carbuilders	5,605	3,848	4,487	3,951	16,107	5,535
Built new in RR shops	0	0	0	0	0	0
Built new—Total	5,605	3,848	4,487	3,951	16,107	5,535
Rebuilt	35	123	0	123	176	0
TOTAL	**5,640**	**3,971**	**4,487**	**4,074**	**16,283**	**5.535**
Locomotives (new and rebuilt)	72	37	N/A	N/A	73	8

Source: Transportation Div., AAR and American Railway Car Institute

'88 Review

Winning the numbers game

The figures were strong across-the-board, reflecting higher traffic and a good handle on costs. Deregulation had a close call in Congress but survived by a single vote.

Workers put finishing touches on Bethlehem Steel's Beth-Combo, a late '88 entry in the booming freight-car market. BN will test-market eight of the combination box/hopper cars.

For the railroad industry, the most important numbers in 1988 were not the impressive net-income figures posted by a number of companies through the first half and the third-quarter and, most likely, for the full year. The most important numbers in 1988 were nine and 10—nine votes in the Senate Commerce Committee in favor of making potentially-devastating changes in the Staggers Rail Act of 1980, but 10 votes against.

Reregulation lost, in the 100th Congress. But the outcome of the Commerce Committee vote could not have been predicted with any certainty right up until the night before the vote was taken in late September.

Railroads may have contributed to the uncertainty and the closeness of the vote, since two major companies were agreeable to what they thought was a compromise proposal dealing with changes in Staggers. But then changes were made, amendments dealing with competitive access and with mandatory requirements regarding railroad use of private freight cars, and the "compromise" fell apart, with the railroads re-uniting and the 10-9 vote saving the day, at least until the 101st Congress is in session.

Other important numbers? These are some:

—Railroad revenue ton-miles continued to climb. Contrary to earlier forecasts, the industry may not have its first one-trillion-ton-mile year, but it won't miss by much, with the total expected to hit 995 billion ton-miles.

—Intermodal trailer/container loadings, which have set new record highs in every year since deregulation, are estimated at 5.5 million loads, up from 5.1 million last year.

—Grain traffic was at a record high in the second half of 1987 and hit another record high in the first half of '88.

—With cost-cutting continuing and despite continued pressure on freight rates, bottom lines are climbing. Last year, a couple of railroads edged close to being what the Interstate Commerce Commission calls revenue-adequate. Revenue adequacy, by the ICC's definition, is a return on investment equal to the cost of capital, which is now around 12%. For 1988, it appears that some railroads will closely approach or even cross that threshold—among them, Burlington Northern, Kansas City Southern, Norfolk Southern, and Union Pacific. For the industry as a whole the rate of return could climb to around 8%, a long way from 12% but an even longer way from the 1.58% of just ten years ago.

—Employment continued to drop this year, with Class I carriers edging ever closer to the 200,000 level, a level thought unthinkable just a few years ago. Railroads and rail unions were free to serve notice last April 1 for contract changes which could have become effective July 1, but while opening proposals were put forth, little else happened on the collective-bargaining front. In the meantime, two railroads that had tried to convince rail labor organizations of the need for change and had tried to make serious change palatable were rebuffed, and each then moved to make changes on its own where it was free to do so under applicable agreements.

—The railway supply industry began actually "supplying" again, after spending most of the 1980s searching for orders without much success. Year-end 1988 will probably see a 20,000th new freight car delivered, a total not reached since 1981. Locomotive orders were also building up, with one railroad alone, Union Pacific, ordering more new units than were delivered to all roads in all of 1983. Ironically, perhaps, 1988 was also the year in which General Motors' Electro-Motive Division for all practical purposes closed its locomotive assembly line at LaGrange, Ill., moving assembly operations to GM's locomotive facility at London, Ont.

- **Signs and portents.** Of course, not all of the notable events of 1988 have had to do with numbers. Among the other notables:

—The railroad map in the West was redrawn, with the consolidation of Denver & Rio Grande Western and Southern Pacific Transportation. After rejecting merger of SPT with Santa Fe in 1987 and then refusing to reopen the case, the Commission promised to handle the Rio Grande-Southern Pacific proposal expeditiously, and it did. The application was filed early this year, and the deal was closed before mid-October, which is probably an ICC record for speedy handling of a major merger proceeding. The consolidation, however, created an imbalance among railroads. Had Santa Fe been allowed to merge with SPT, there would have been three major carriers in the West and three in the East. Now, there are four in the West, of which Santa Fe is the smallest, leading to questions as to whether the next few years may see attempts to create true transcontinental railroads.

1988 at a Glance

	1988*	% change from 1987
Revenue ton-miles	995 billion	+5.8%
Operating revenues	$28.2 billion	+6.0%
Trailer/container loadings	5.5 million	+7.9%
Freight cars delivered	20,000	+53.8%
Locomotives delivered	400	+333.0%

**Railway Age estimates.*

—Railroads and the Federal Railroad Administration continued efforts, sometimes together and sometimes separately, to battle the problem of alcohol and drug abuse in the workplace. Operation Red Block, a joint labor-management program aimed at rehabilitation, won praise. But the FRA continued to take a harder line. Original FRA rules on testing, including post-accident and probable-cause testing, were under review by the U.S. Supreme Court. But even as the high court was considering those rules, FRA issued another set, these providing for random drug testing.

—The Rail Safety Improvement Act of 1988 was passed and signed by President Reagan. It was perhaps the most comprehensive legislative look at rail safety since passage of the original act in 1970. The key change: Heretofore, FRA has had safety authority only over companies. Now, it also has authority over individuals, contract and exempt.

—Also before the Supreme Court was a case instituted by rail labor and based on its demand that it be represented in sale of rail lines, the sales that during the 1980s have spawned what's now known as the "regional railroad movement." The position of the Interstate Commerce Commission has been that line sales to non-railroad entities do not require application of labor-protective conditions. Labor disagrees, looking at sales that have resulted in creation of non-union railroads and unionized railroads with agreements not matching those in effect on predecessor railroads. Labor pressed its case, even though it could be proved that these line sales preserved rail service and rail employment.

—Trailer Train, an institution in the industry, got an unexpected, and unexpectedly serious, challenge on its filing with the ICC for an extension of its pooling agreement and antitrust exemption. The challenge came from the U.S. Department of Justice and The Greenbrier Companies (which include a freight-car leasing company and one of TT's carbuilding suppliers, Gunderson). The challenge centered on Trailer Train's alleged monopsony, related to purchasing power. Heading into December, the case had not been decided, but all concerned were expecting a decision from the Commission before the end of the year.

—After a couple of decades of railroads becoming conglomerates or forming the basis for conglomerates, railroads once again seemed to be becoming railroads. Cases in point: Burlington Northern, Chicago & North Western, Southern Pacific-Rio Grande, and Illinois Central. Other companies, including CSX and Santa Fe Southern Pacific, were working on restructuring programs that put increased emphasis on the transportation parts of the business.

—Amtrak survived another year, with increasing traffic, reduced dependence upon subsidy, Congressional authorizations for future-year funds, and comprehensive tests of three types of equipment to cut running times on the New York-Boston part of the Northeast Corridor to make that route as competitive with airline shuttle flights as the New York-Washington part of the route has become.

—There were two significant labor-management confrontations, both involving the United Transportation Union. One was with Guilford Transportation Industries, the other with Chicago & North Western. As 1988 wound down, the Guilford-UTU matter remained unresolved, with arbitrators' rulings going against it that the carrier was appealing. The C&NW-UTU dispute did come to resolution, but not without two brief strikes and Congressional intervention. North Western was determined to reduce crew consist, UTU was determined to resist, an emergency board sided mostly with the railroad, and it was the board's recommendations that Congress imposed. Among the key points in the "settlement": The railroad would be free to cut one brakeman position, and arbitration would apply if further cuts were proposed; and there would be no so-called lonesome pay for remaining crew members working reduced-crew assignments. Congress intervened not because of the potential interruption of freight service but because 40,000 Chicago-area commuters would be inconvenienced by a strike. North Western was prepared to continue to operate its core freight services with supervisors and replacement personnel, but it did not have the opportunity to keep the railroad running in the face of a strike.

- **The supply side.** If there was another major story about Railroading-'88, it fell under the broad heading of technology. These were among the developments:

—For locomotives, the capabilities of the microprocessor-controlled units of both General Electric and the General Motors Locomotive Group were expanded. And the possibilities in a.c. traction were expanded by GM beyond prototypes for Amtrak to include testing to prove the value of a.c. in heavy-duty freight operations. And, the old, traditional locomotive control stand began giving way to a console-type arrangment of throttle, brake and other controls, an arrangement that has been common in Canada for years. Santa Fe was the first to look at new control (and carbody) designs; Union Pacific was the first to order.

—Advanced train control systems con-

(Continued on p. 40)

’88 Review

(Continued from p. 28)

tinued under test, mainly with BN and the ARES system developed by Rockwell International and with UP and AMCI, the former a multi-part control system making use of both satellite and ground-based equipment and the latter a ground-based, transponder-based system.

"Not the least of our problems," observed Peter J. Detmold, executive director of the ATCS project, "is how to demonstrate that the return on ATCS will justify investment that may well reach $150 million on the largest railways." One factor that is hard to quantify but should not be overlooked, he said, is the vastly greater service reliability that ATCS will make possible.

—While train-control systems continued to be developed and tested, railroads and suppliers were once again heading into programs to identify individual pieces of equipment, avoiding the term "automatic car identification" because of all the negatives associated with aci and calling it something, anything, else, such as automatic vehicle identification. Again, BN led in testing systems, using equipment from General Railway Signal and Union Switch & Signal-Amtech. But the first major buyers were American President Companies and C&NW.

—Freight cars? Probably the biggest development was the introduction of the 125-ton double-stack container well car, placed in service just as domestic containerization appeared to be ready to begin its long-predicted growth. Introduction of the high-capacity railcar also coincided with the introduction of the 53-foot container, joining the container family of 20-, 40-, 45, and 48-foot units, and bringing another complication as to what size container can be loaded in the top position, where and on what cars. Technological development in stack-car equipment, however, was not without its problems. As the year drew to a close, several derailments involving stack cars were under investigation in order to determine a cause or causes.

Late in the year, there were roll-out ceremonies for two new freight cars for which their builders have high hopes. One was Bethlehem Steel's 100-ton-plus, multi-purpose Beth-Combo, which can be adapted for hauling cargoes ranging from grain to lumber; Burlington Northern ordered an initial eight of the combination box/hopper cars. Another promising newcomer was Transit America's "high capacity coal car for the 1990s," a two-unit, three-truck articulated car known as the HiCube IIQD, an outgrowth of the HiCube 2000 that was developed under the AAR's Track-Train Dynamics Program.

—Developmental work and testing by Servo and Harmon indicated that acoustic detection methods can in fact provide early warning of possible failure of roller bearings in freight-car trucks. Used in conjunction with infrared hotbox detectors, the acoustic devices could go a long way toward solving two problems, one associated with the rapidity of bearing failure once the process begins, and the second associated with readings resulting in train-stops in which no bearing problem can be found. One railroad's vice president-operations, looking at the dozens of papers to be presented at September's meeting of the Coordinated Mechanical Associations, noted that a presentation on acoustic detection might well be the most significant item on the whole program, dealing with a technology which, he said, railroads would line up to buy. ■

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Railway Age

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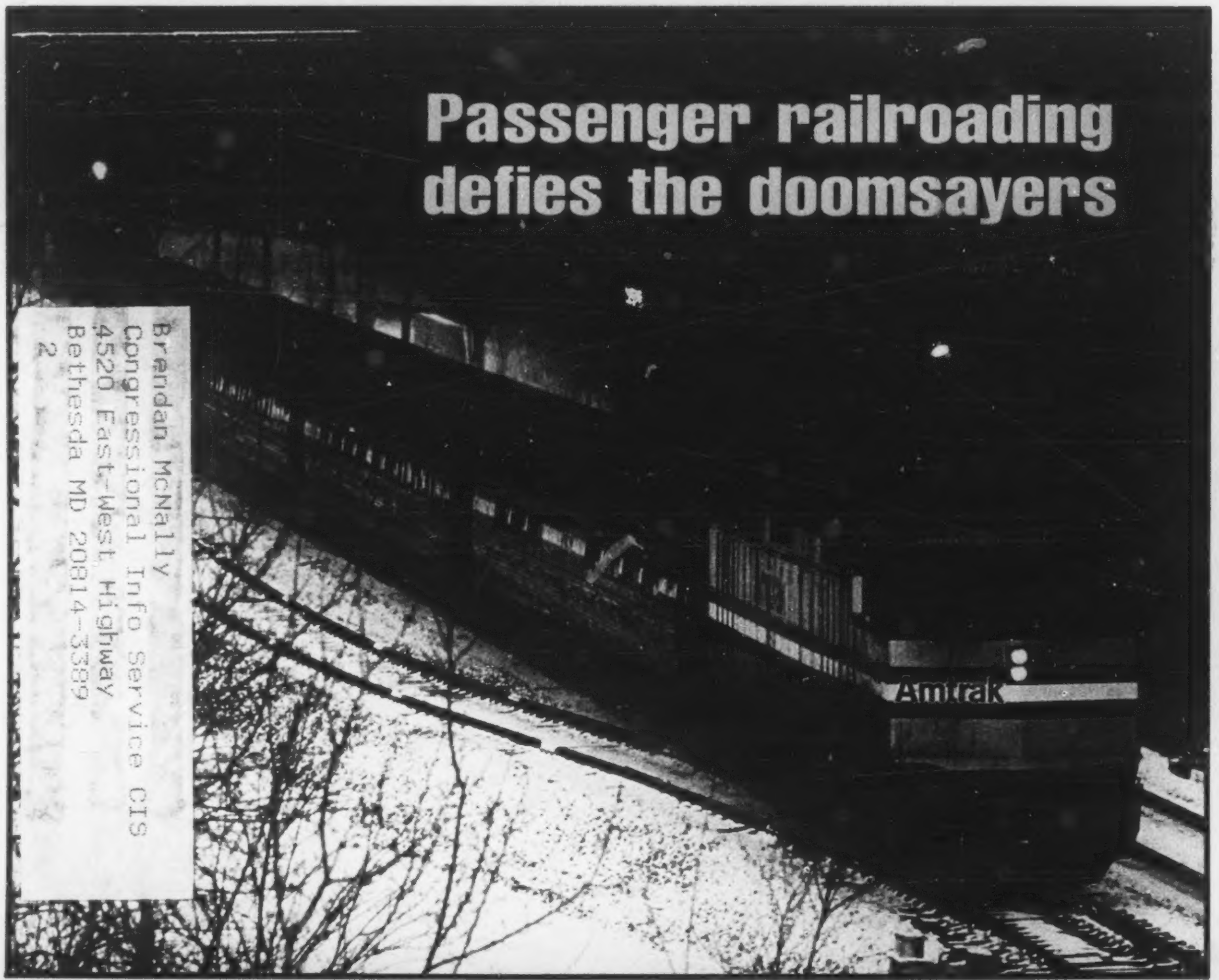
Passenger railroading defies the doomsayers



Brendan McNally
Congressional Info Service CIS
4520 East-West Highway
Bethesda MD 20814-3389
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Conrail sets the pace in mechanized m/w

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Union Pacific gets a fix on filters

January 1989

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Harsh words from Washington and austerity-level funding have failed to halt the growth of intercity, suburban, and transit trains. As most old systems thrive, new ones are in planning/construction stages.

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INSIDE

How much buying power?

LUTHER S. MILLER

Suppliers and other trend-watchers trying to get a fix on the size of the railway market in 1989 will find some useful guidelines—maybe even a few surprises—in this issue of *Railway Age*.

Our updated forecasts for new freight equipment (p. 26) call for capital outlays totaling around $2 billion. That's based on the expectation that close to 30,000 new freight cars will be added to the fleet at a cost of around $40,000 apiece, and that more than 700 locomotives will come off the lines of General Motors and General Electric at around $1.3 million a copy.

Add to that the substantial car and locomotive rebuild programs that are under way, and to *that* the more than $2 billion in capital funds earmarked for improvements to track, signals and communications, and other fixed facilities; then to all of the above add the billions of dollars that the freight railroads spend each year for materials and supplies that are charged as operating, not capital, expenses, and you begin to get some idea of this industry's buying power.

But that is only part of the story. The passenger railroads—intercity, commuter, rapid transit, and light rail—will have capital budgets this year equalling or exceeding those of the freight carriers; they also will spend additional billions on operating materials and supplies. This lesser-known railway market, which is fragmented and for which no central data bank is maintained, is examined in our annual passenger review and outlook feature (p. 31).

Conrail is one of the biggest spenders among the freight railroads. This year Conrail has a capital budget of around a half-billion dollars, and more than half of that will go for track improvements.

Conrail's track record is, in every way, an extraordinary one.

At one time, recalls Benjamin J. Gordon, the railroad's chief engineering officer, Conrail had 8,000 miles of slow orders. But Conrail rolled into 1989 with only 250 miles of slow-ordered track, mostly on minor branch lines.

The journey from 8,000 miles of slow orders to 250 was not fast, it was not easy, it was not cheap. At one time Conrail was laying over 1,000 miles of rail and installing close to 5 million ties a year.

Maintenance is now down to ordinary levels—but what is far from ordinary in Conrail's engineering department is the fleet of high-tech track machines. Four of these—a right-of-way boring machine, a continuous action tamper, a track stabilizer, and a tie change-out machine—are the subjects of a story in this issue (p. 41).

Two of them are particularly noteworthy, because they have received little if any publicity so far, though each represents a milestone in mechanized m/w. One is the right-of-way boring machine, now the only one of its kind in North America. This $750,000 machine just about paid for itself on its first job, the Boston & Albany clearance project, and bigger and more rewarding tasks lie ahead as Conrail prepares to explore and catalog its ballast and subgrade conditions, system-wide.

The other is a tie change-out machine, of which Conrail now has the center section with front and rear sections under design. By midsummer, Conrail will have something that does not now exist anywhere in the world—a selective tie change-out machine.

Railway Age
...for the new age of railways and rail transit

Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200 (Telex 425421 SIMB UI)
Fax: 212-633-1165

CHARLES H. ELLWANGER, Publisher
LUTHER S. MILLER, Editor

Publishing Director: Robert G. Lewis

Managing Editor: Judy McCusker
Contributing Editor: William D. Middleton
Art Director: Maurice H. Mates
Graphics Director: Diana Line
Graphics Coordinator: Pat Nash
Photo Editor: Kent Patterson

Vice President-Marketing: Arthur J. McGinnis, Jr.
Production Manager: Tina Small
Circulation Director: John Scunziano
Circulation Fulfillment Manager: Marie Faranda

Western Editorial Offices
Chicago, Ill. 60604,
175 W. Jackson Boulevard, Suite A-1927
312/427-2729
Fax: 312-427-3014

GUS WELTY, Senior Editor
Intermodal Editor: Bill Fahrenwald
Editorial Assistant: Wanda Welty
Contributing Editor: F. K. Plous

International Offices
Falmouth, Cornwall, TR11 4RJ, England
P.O. Box 8
Telephone: 44-326-313945
Fax: 011-44-326-319066

International Editors: Michael Knutton,
David Briginshaw

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MARKET OUTLOOK

Equipment

Amtrak: Ordered an additional 50 coaches from Bombardier at a cost of $50 million, thus exercising its first option under an agreement with the builder signed last June. Under that agreement, Amtrak placed a base order for 50 cars with two options for future purchase of an additional 50 cars each. The new order consists of 42 passenger coaches and eight food service cars. Delivery will take place between November 1989 and March 1990.

GE Capital Railcar Services: Is rebuilding 250 boxcars at its Texarkana, Ark., facility and lining them with a laminate of AZDEL, an impact-resistant white plastic that resists punctures, cracks, and chips.

Norfolk Southern: Placed a $40 million order with Trinity Industries for 1,000 open top hopper cars for the haulage of coal, with deliveries to begin in the second half of 1989.

Southern Pacific: Is acquiring 150 70-foot, 100-ton-capacity center beam Gunderson-built flatcars for the movement of lumber from the Pacific Northwest to eastern destinations.

XTRA: Is acquiring 500 45-foot-by-110-inch dry van trailers from Dorsey Trailers. Delivery of the high cube units is to be completed this month.

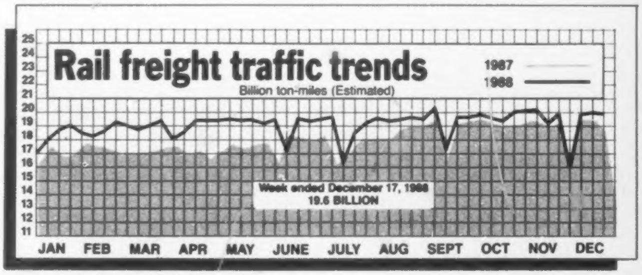
Revenue freight carloadings

Commodity	Dec. 17 week	Dec. 10 week	Dec. 3 week	Nov. 26 week
Grain	29,234	29,654	28,878	19,729
Other farm products	4,289	4,471	3,929	3,637
Metallic ores	19,372	23,780	21,516	19,290
Coal	127,399	132,530	128,763	110,302
Crushed stone, gravel and sand	13,203	15,728	15,541	11,199
Nonmetallic minerals	9,257	9,524	10,483	7,517
Grain mill products	10,848	11,333	11,430	9,396
Food and kindred products	10,927	11,372	11,676	9,102
Primary forest products	9,941	10,559	10,146	6,872
Lumber and wood products except furniture	6,972	7,048	7,358	5,533
Pulp, paper and allied products	11,201	11,314	12,704	11,151
Chemicals and allied products	28,007	28,750	30,808	22,833
Petroleum products	5,402	5,618	5,549	4,205
Stone, clay and glass products	9,589	11,112	11,250	8,290
Coke	5,998	5,687	5,866	5,484
Metals and products	9,483	9,255	10,089	9,165
Motor vehicles and equipment	24,581	24,248	23,730	16,023
Waste and scrap materials	9,216	9,784	9,512	6,780
Forwarder and shipper assn. traffic	2,042	2,130	2,007	1,686
All other carloads	89,550	89,240	86,385	68,782
Total Cars Loaded	**436,551**	**453,137**	**447,620**	**356,976**
% change from previous year	2.2	2.0	1.1	2.8
Estimated revenue ton-miles (billions)	19.6	20.0	19.9	16.0
% change from previous year	1.7	1.7	0.9	2.6
Total:	**1988**	**1987**		**% change**
50 weeks	963.8	911.0		5.8

Piggyback loadings

	Dec. 10 week	Dec. 3 week	Nov. 26 week	Nov. 19 week
Trailers/containers	119,683	111,991	91,630	119,010

Cumulative total, 49 weeks		**% change from 1987**
Trailers/containers	5,399,044	3.6



Source: Association of American Railroads

Facilities

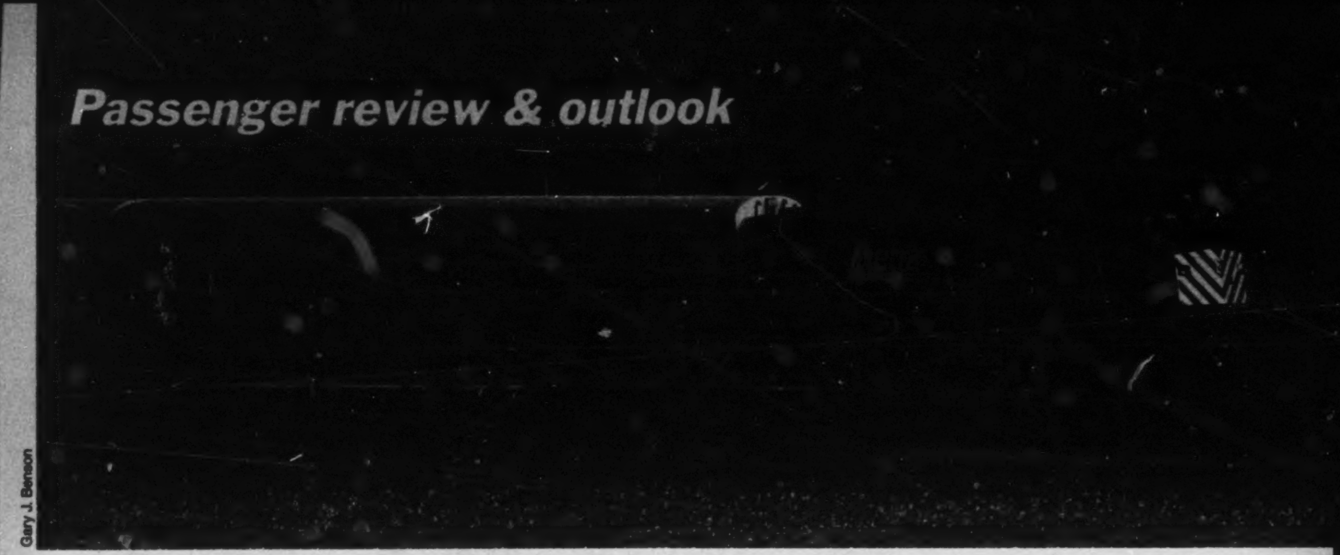
Canadian National: Will build a new, $19 million (Canadian) intermodal terminal near Vancouver to replace two existing operations downtown which are nearing capacity. The new terminal, to be built east of Thornton Yard at Port Mann, is to open in 1991.

Greater Cleveland Regional Transit Authority: Awarded a $14 million contract to Union Switch & Signal for the supply of wayside cab signaling equipment for the eastern half of GCRTA's heavy rail transit network. Similar equipment is already in use between Union Terminal and Windemere, eastern terminal point of the GCRTA network.

New York Metropolitan Transportation Authority: Approved a 1989 capital budget of $1.4 billion for the New York City Transit Authority and the Long Island and Metro-North railroads. Most of the money will go for track, signaling and communications, power supply, and station improvements.

PATH: Awarded a $1.3-million contract to Kaiser Engineers Group for engineering services for installation of a Supervisory Control and Data Acquisition (SCADA) system. The system, which has a total cost of $20 million, will permit central control of power supply for Newark-Manhattan trains and for environmental and security needs at all PATH stations.

Southern Pacific: Has expanded its Armourdale Yard at Kansas City at a cost of $2.6 million. The project, to be completed in December, involved expenditure of $1.5 million for addition of more than two miles of track and 28 switches in the classification yard itself, and $1.1 million for construction of a two-track, 60-car-capacity intermodal facility. Further expansion of the intermodal terminal is planned for 1989.



Gary J. Benson

Ridership on the Chicago area's Metra trains rose to 260,000 trips a day in 1988, a 6% increase attributed to good service and aggressive marketing.

Defying the doomsayers

Harsh words from Washington and austerity funding levels have not stopped the growth of passenger railroads. Ridership is up, old systems are expanding, and new lines are being built.

By LUTHER S. MILLER, Editor

During their years in the White House, neither Jimmy Carter nor Ronald Reagan showed a marked affection for passenger trains. Each in his own way tried to put trains in their place, and that place was nowhere near the beginning of the federal assistance line.

President Carter particularly hated the notion of federal aid to rapid transit, which he viewed as old-fashioned and obsolete, and he cited Washington's Metrorail system as an example of money down the tube. President Reagan's hostility was more impartial: He tried to cut Amtrak's funding to zero, and he espoused drastic cuts in assistance to urban and suburban trains.

But the trains refused to die, and as the Carter-Reagan years begin to fade into history, passenger railroading is flourishing as it has seldom flourished in the postwar era.

• **A multi-billion-dollar market.** There is compelling evidence of this in the marketplace. Passenger railroad agencies this year will place orders for 800 to 900 new cars, about $1 billion worth of business. They already have firm plans for ordering 1,700 to 2,500 more cars during the 1990-1994 period. They have 537 cars on order and undelivered. They accepted delivery of 575 cars last year. And that only begins to tell the story of passenger railroads' impact on the railway market.

New York's Metropolitan Transportation Authority alone has a 1989 capital budget of $1.4 billion for improvements to the rolling stock, signaling and communications, track, and stations of its three operating subsidiaries, the New York City Transit Authority, the Long Island Rail Road, and Metro-North Commuter Railroad. Additional billions will be invested by other cities and states modernizing and expanding older systems and building new ones. All together, the passenger railroads' capital investment this year is likely to exceed that of all of the Class I freight railroads.

Even more compelling evidence of the vitality of passenger railroading is found at the farebox.

• **Rail ridership gains.** Transportation Policy Associates estimates that Amtrak and commuter rail ridership rose by 3.2% in the first nine months of 1988. By comparison, the number of intercity passengers carried by all modes—air, bus, and rail—was up by only one-tenth of 1%. Air ridership actually dropped a fraction of a point, and bus ridership, which has fallen 12% since 1980, continued to decline.

Amtrak in fiscal 1988 carried 21.5 million people, topping its previous ridership record of 21.4 million established in the oil-crisis year of 1979. Passenger miles rose for the sixth straight year, to a new high of 5.7 billion, up 9% over 1987. Amtrak's cost recovery ratio climbed to 69%, two percentage points ahead of the railroad's target, perhaps the highest ratio of revenues-to-expenses to be found among major railroad passenger systems anywhere in the world. This means that Amtrak has required less and less in operating subsidies: Federal funding dropped from $895 million in 1986 to $602 million in 1987 and to $581 million in 1988. (It does not mean, however, that Amtrak, even as it continues to drive costs down and revenues up, does not need additional federal funding. To keep pace with soaring demand, Amtrak estimates that it needs to spend $1 billion in the next decade on new equipment, and it cannot raise all of that money internally or from the kind of innovative financing which last year led to the order of 100 new coaches from Bombardier at a cost of $100 million.)

A spot check by *Railway Age* revealed these ridership trends elsewhere:

—Washington Metrorail, the nation's showpiece rapid transit line, late in 1988 was carrying more than 509,000 riders a day, up 7% over 1987.

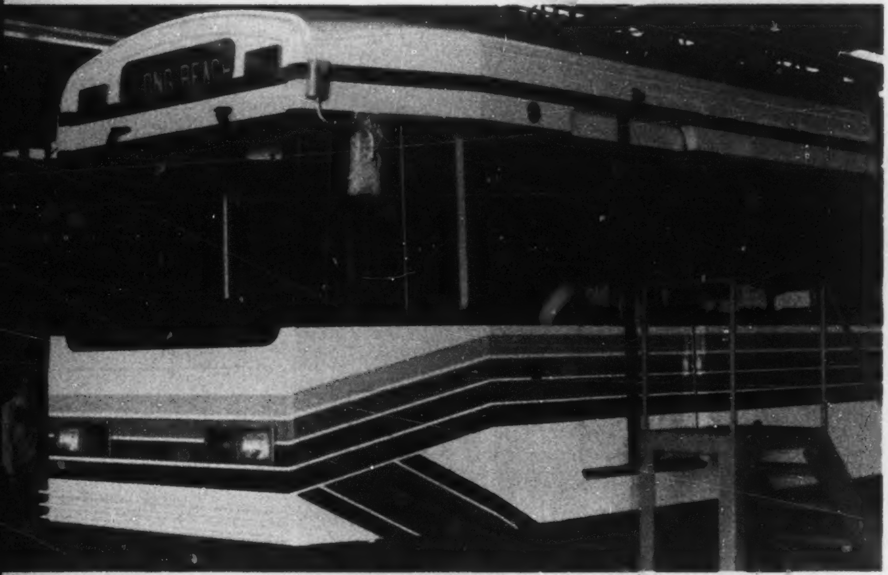
—Average weekday ridership on Bay Area Rapid Transit trains rose to 205,000 in December, up 5% over the 195,000 daily riders BART was carrying a year ago.

—The San Diego Trolley last year averaged 30,000 riders a day, an increase of more than 10% over 1987.

—Ridership on Massachusetts Bay Transportation Authority commuter trains rose to 70,000 a day, compared with 52,000 a year earlier. MBTA commuter rail patronage over a five year period has increased by 100%. Officials attribute the increases to a combination of factors—a bustling economy and better equipment and service. MBTA recently acquired 60 coaches from Messerschmitt-Bolkow-Blohm (MBB) and 40 from Bombardier, and this year plans to acquire 75 double-decker coaches. Worldwide proposals for the double-decker fleet are now under study.

—PATCO's Lindenwold Line, which connects New Jersey with Philadelphia and has long been regarded as a model of no-frills transit, carried an estimated 11,175,000 riders in calendar 1988, up slightly from 1987. Average weekday ridership topped 41,000.

—Chicago Transit Authority's rapid transit ridership held steady at about 588,000 riders on an average weekday, despite service problems arising from slow-ordered track. But ridership on CTA's newest line, linking the Loop with O'Hare International Airport, rose substantially. About 7,000 riders a day boarded CTA trains at O'Hare last year, compared with 6,000 a day in 1987. CTA does not routinely make exit counts, but surveys have indicated that ridership to the airport from downtown is greater than in the other direction since many people start business trips from the Loop, then return on weekends to suburban destinations.


Los Angeles, which is getting 54 light rail cars from Nippon Sharyo, has put this full-scale model of the front quarter of an LRV on public display.

—The Chicago area's Metra suburban trains racked up about 260,000 passenger trips a day in 1988, an increase of 6% over 1987. Metra trains operate in a growth area, they are aggressively marketed, and additional parking space is attracting new business. About $6.3 million was invested in parking lots in 1988, and another $6.5 million will be spent on parking this year.

—The first, eight-mile segment of the Baltimore Metro was living up to pre-opening projections, with 55,000 weekday passengers.

—The 15-mile light rail line of Tri-Met in Portland, Ore., another newcomer, continued to be counted among the success stories with average weekday ridership of 19,000, in line with projections. Late last year Tri-Met was beginning to experience overload problems during peak hours.

That was generally the picture around the country, with one exception—the New York City area, where some passenger lines reported either a decline in growth or an actual drop in patronage, though for reasons that seemed to have very little to do with railroading itself.

• **Wall Street woes affect transit.** The Wall Street crash of late 1987, while it did not affect employment in the New York area generally, nonetheless caused a 3% loss of jobs in the financial, insurance, and real estate businesses—businesses whose workers tend to live in commuter-train territory.

Among New York area passenger carriers, Metro-North appeared to be the least affected, though it fell far short of anticipated growth last year. Metro-North's estimated 1988 rider count of 54,922, 000 was about one million ahead of the previous year; in the two prior years Metro-North reported increases of 2.5 million (1987) and 2.1 million (1986). Metro-North believes the lack of adequate parking has also deterred riders and has embarked on a $20 million program to increase parking spaces.

Harder hit was the Long Island Rail Road, whose average weekday ridership dropped from 273,000 in the fall of 1987 to 271,300 in the fall of 1988.

The New York City Transit Authority held even with about 3.6 million riders a day; toward the end of the year, ridership was rising.

PATH, which had carried a record 58.2 million riders across the Hudson River in 1987, dropped to 57.2 million in 1988, with average weekday ridership declining from 207,000 to 202,000. PATH attributed the decline not only to the loss of jobs in the lower Manhattan area it serves but also to the increase of jobs on the New Jersey side of the Hudson.

NJ Transit officials blamed Wall Street's doldrums for a 5.4% decline in ridership. In the preceding four years, train ridership had increased by 40% and NJ Transit had anticipated a 5% increase in 1988. NJ Transit has also been plagued by a poor on-time record. Improved service is expected when the $48 million overhaul of 230 Arrow 3 electric cars, approved in December, is completed.

• **Extensions and new starts.** The first big event of the new year will be the Jan. 9 inauguration of the nation's newest commuter service, the 67-mile operation of Tri-County Commuter Rail over CSX track linking Miami, Ft. Lauderdale, and West Palm Beach. UTDC supplied 18 bi-levels for the service.

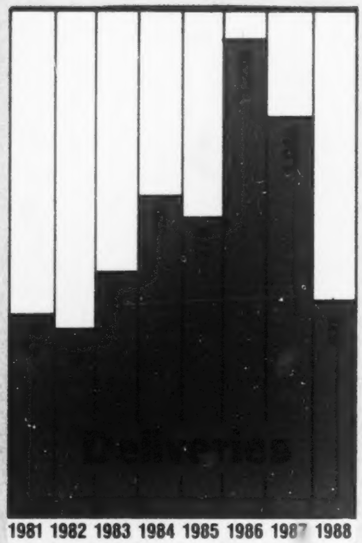
The year ahead will be a busy one for builders and planners in other parts of the country.

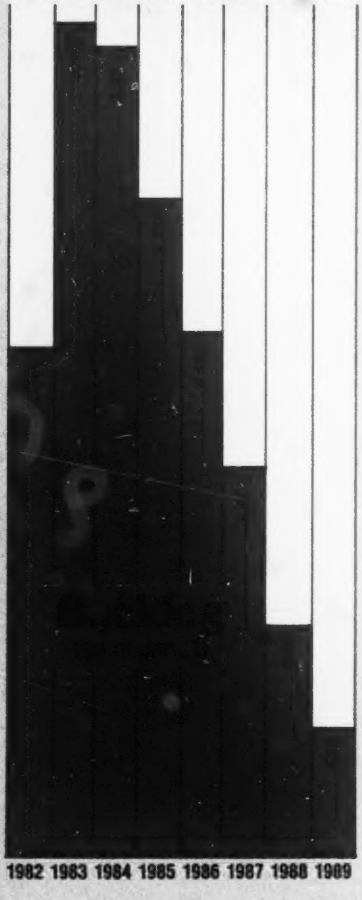
Existing systems are expanding. Bay Area Rapid Transit (BART) is ready to embark on a $1.7 billion program calling for 33.1 miles of new track, ten new stations, and a new maintenance yard. BART will be extended from West Pittsburg in Contra Costa County to Castro Valley/Dublin, Irvington, and Warm Springs in Alameda County, and from Daly City south to San Francisco's International Airport.

In Boston, studies are under way that could culminate in a $400 million project to extend service from South Station along the Old Colony Line to southeastern Massachusetts. Financing of the local share should be no problem: Massachusetts in 1988 approved a $3.1 billion transportation bond issue with $838 million of the proceeds earmarked for MBTA.

Chicago is moving ahead with plans for a

Passenger-car market at a glance





These cars were delivered in 1988:

Purchaser	No. of cars	Type	Builder
Alaska Railroad	8	Intercity	Daewoo
Amtrak	1	Intercity prototype	Budd-Amtrak
Boston (MBTA)	33	Commuter	Messerschmitt-Bolkow-Blohm
	50	Rapid transit	UTDC, Inc.
Galveston	3	Light rail	Miner Railcar
Miami (Tri-Rail)	18	Commuter	UTDC, Inc.
NJ Transit Rail Operations	23	Commuter	Bombardier
	22*	Commuter	Morrison-Knudsen
New York (NYCTA)	89	Rapid transit	Kawasaki
	95	Rapid transit	Westinghouse Amrail
San Diego (MTDB)	3	Light rail	Siemens-Duewag
San Francisco (BART)	45	Rapid transit	Soferval
Santa Clara County	18	Light rail	UTDC, Inc.
Toronto (GO Transit)	38	Commuter	UTDC, Inc.
Toronto (TTC)	60	Rapid transit	UTDC, Inc.
	37	Light rail	UTDC, Inc.
Washington (WMATA)	32	Rapid transit	Breda
Total	**575**		

*Original self-propelled Arrow I cars, converted to push-pull coaches.

Work goes forward on this undelivered backlog:

Purchaser	No. of cars	Type	Builder
Amtrak	100	Intercity	Bombardier
Boston (MBTA)	56	Commuter	Bombardier
	2	Rapid transit	UTDC, Inc.
Galveston	1	Light rail	Miner Railcar
Los Angeles (LACTC)	54	Light rail	Nippon Sharyo
Los Angeles (SCRTD)	30	Rapid transit	Breda
New York (NYCTA)	11	Rapid transit	Kawasaki
New York (LIRR)	10	Prototype double-deck commuter	Toyku Car
San Diego (MTDB)	38	Light rail	Siemens Duewag
San Francisco (BART)	100	Rapid transit	Soferval
Toronto (GO Transit)	85	Commuter	UTDC, Inc.
Toronto (TTC)	36	Rapid transit	UTDC, Inc.
	14	Light rail	UTDC, Inc.
Total	**537**		

Orders likely to develop in 1989:

Purchaser	No. of cars	Type
Baltimore (MTA)	35-45	Light rail
Baltimore (MARC)	15-25	Commuter
Boston (MBTA)	75	Commuter
	100	Rapid transit
Chicago (Metra)	16	Commuter
Chicago (CTA)	200	Rapid transit
Los Angeles (SCRTD)	42	Rapid transit
NJ Transit Rail Operations	50-75	Commuter
New York (NYCTA)	36	Prototype rapid transit
New York (Metro-North)	48	Commuter
N. Virginia (NVTC)	38	Commuter
Portland (Tri-Met)	10	Light rail
Sacramento	6-10	Light rail
Toronto (TTC)	41	Light rail
Washington (WMATA)	110-140	Rapid transit
Total	**822-901**	

The five year (1990-1994) outlook:

Purchaser	No. of cars	Type
Baltimore (MTA)	0-20	Light rail
Baltimore (MARC)	15-50	Commuter
Boston (MBTA)	50-200	Commuter
	150-185	Rapid transit
Buffalo (NFTA)	6	Light rail
Calgary	11	Light rail
Chicago (Metra)	41-297	Commuter
Chicago (CTA)	0-150	Rapid transit
Los Angeles (LACTC)	39-60	Light rail
Los Angeles (SCRTD)	0-18	Rapid transit
New York (NYCTA)	1,000	Rapid transit
New York (Metro-North)	46-72	Commuter
Portland (Tri-Met)	10-32	Light rail
Sacramento	51	Light rail
San Diego (MTDB)	12-49	Light rail
San Francisco (Caltrans)	10-15	Commuter
San Francisco (MUNI)	24	Light rail
St. Louis	31	Light rail
Toronto (GO Transit)	40-60	Commuter
Toronto (TTC)	86	Rapid transit
Vancouver (BC Transit)	10-20	Light rail
Virginia Beach/Norfolk (Tidewater Transportation District)	14	Light rail
Washington (WMATA)	90-100	Rapid transit
Total	**1,736-2,551**	

double-track, nine mile line that will extend rapid transit service to the city's Southwest Side and to Midway Airport. Estimated cost: $496 million.

Baltimore is to start construction this spring on a new section of its Metro subway, Section C, a 1.5 mile line.

In San Jose, construction is under way on the southern half of the 20-mile Guadalupe Corridor Light Rail Project.

San Diego Trolley this year will complete an 11.2 mile addition to its system.

There's also activity on the new-start front.

In Los Angeles County, 40 miles of light rail are under construction and four miles of heavy Metro Rail are being built in downtown Los Angeles. For one of its light rail projects, the Norwalk-El Segundo line, the Los Angeles County Transportation Commission last year opted for automated LRT.

Maryland's Mass Transit Administration has won a go-ahead to build a 27 mile, $290 million LRT line in Baltimore's Central Corridor.

The Northern Virginia Transportation Commission is far advanced with plans to initiate commuter service on two lines radiating out of Washington—a 55 mile line to Fredericksburg, Va., and a 33 mile line to Manassas, Va. These services will require eight locomotives and 38 cars.

This month, the Bi-State Development Agency will begin final engineering and design of the first, 18 mile phase of St. Louis Metro Link, a light rail line that will run from East St. Louis, Ill, through downtown St. Louis and on to Lambert International Airport. Bi-State late last year received a first installment of $150 million from the Urban Mass Transportation Administration and expects total federal funding of $287.7 million.

Other light rail systems are in the early planning stages. In Minneapolis, the Hennepin County Commissioners last summer voted to proceed with a plan for a first stage 29 mile system estimated to cost $497 million in 1988 dollars. In Virginia Beach, Va., the Tidewater Transportation District Commission is leaning toward a decision to build a 17.7 mile, $102 million LRT line, using 16 miles of existing Norfolk Southern right-of-way to link Virginia Beach with Norfolk.

Miami Beach continues to study the feasibility of a light rail line connecting the resort area with the hotels and convention facilities of downtown Miami.

In Las Vegas, Nev., magnetically levitated trains are on the way to getting their first U.S. test as work continues on a $60 million, 1.3 mile people mover that is being supplied by Magnetic Transit of America, Inc. It will connect downtown Las Vegas with a convention center/sports complex. (The Las Vegas line is modeled after the M-Bahn system now under test in West Berlin. On Dec. 19, the Berlin line was involved in an accident during a manual test operation. Magnetic Transit America issued a statement pointing out that "the accident was caused by human error and not by technical failure" and that "the Berlin M-Bahn has demonstrated an excellent safety record under automatic operation.")

Ridership trends

Amtrak and commuter roads

Year	Passengers (millions)
1980	300.2
1981	288.6
1982	278.4
1983	280.9
1984	286.9
1985	295.1
1986	323.2
1987	331.7
1988*	342.3

*Estimated

Transportation Policy Associates

A number of cities, meanwhile, are looking at a novel use for light rail that is being put to the test in Galveston, Tex. Last summer, Galveston, seeking to revive its sagging commercial district and also to provide an added attraction for tourists, opened a 4.7 mile trolley line looping through the city. Miner Railcar Services, Inc. custom-built four self-propelled cars for the line; they resemble the 1900-1910 vintage Portland, Ore., cars.

- **High speed plans on a slow track.** Talk continued last year—and there will be more of it this year—of building high-speed rail lines in busy traffic corridors. For the immediate future, prospects are dim that any high speed project will get beyond the talking stage, through planners are optimistic for action toward the middle or late '90s.

Farthest ahead is the Florida High Speed Rail Transportation Commission, which last year selected TGV of Florida and the High Speed Rail Corp. as qualified applicants for a franchise to build and operate a system linking Miami, Orlando, and Tampa. The two competing proposals are under study, and Florida does not expect to award a franchise before 1991 at the earliest. Florida has also asked for proposals for a maglev line in Orange County, home of Disney World. Responses are due March 2.

Interest in high speed passenger rail is also strong in Texas, and last year a $700,000 contract was awarded to a consulting team to study ridership potential in the Houston-Dallas-San Antonio corridor.

High speed in the commonly accepted sense of the term is not what Amtrak has in mind for the Boston-New York segment of the Northeast Corridor—but both Amtrak and the Coalition of Northeastern Governors want higher speeds on the curve-ridden line between these two cities, and it was toward this end that Amtrak tested Canadian LRC, French Turboliner, and Spanish Talgo trains in the Corridor last year. Final reports on these tests are expected to be in the hands of decision-makers early this year. A CONEG spokesman has said that as many as 50 cars for the service might be ordered during 1989, although Amtrak is putting no additional equipment on its official projection list until it sees where the money is coming from. ANF Industrie, which hopes to see its Turboliners placed on this line, estimates that running time between New York and Boston can be reduced to three hours (from the present four hours and 20 minutes) for an outlay of $200 million for rolling stock and $172.5 million for track and signaling improvements.

- **Controlling car costs.** With passenger railcars now priced at an average of $1.2 million each, buyers are looking for ways both to control costs and improve the product.

The Urban Mass Transportation Administration, which since its inception has assisted in the purchase of some 7,000 cars, last year awarded $800,000 in technical study grants to four transit systems to develop specification and bid packages for lower priced cars. UMTA later will award a capital grant to the system "that has most effectively achieved the goal of cost containment."

The technical study grants went to the Atlanta Regional Commission, in cooperation with the Metropolitan Atlanta Regional Transit Authority, $208,000; NJ Transit, $200,000; Chicago's Metra system, $200,000; and the Southeastern Pennsylvania Transportation Authority, $192,000.

A more efficient car is the goal of the New York City Transit Authority, which has recently replaced or rebuilt most of its car fleet and will soon be in the market for a new generation of cars which it plans to acquire at the rate of 200 a year. NYCTA this year will place orders with competitive builders for 36 prototype cars, all with a.c. traction. From this program NYCTA hopes that its new generation car will emerge. ■

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Railway Age

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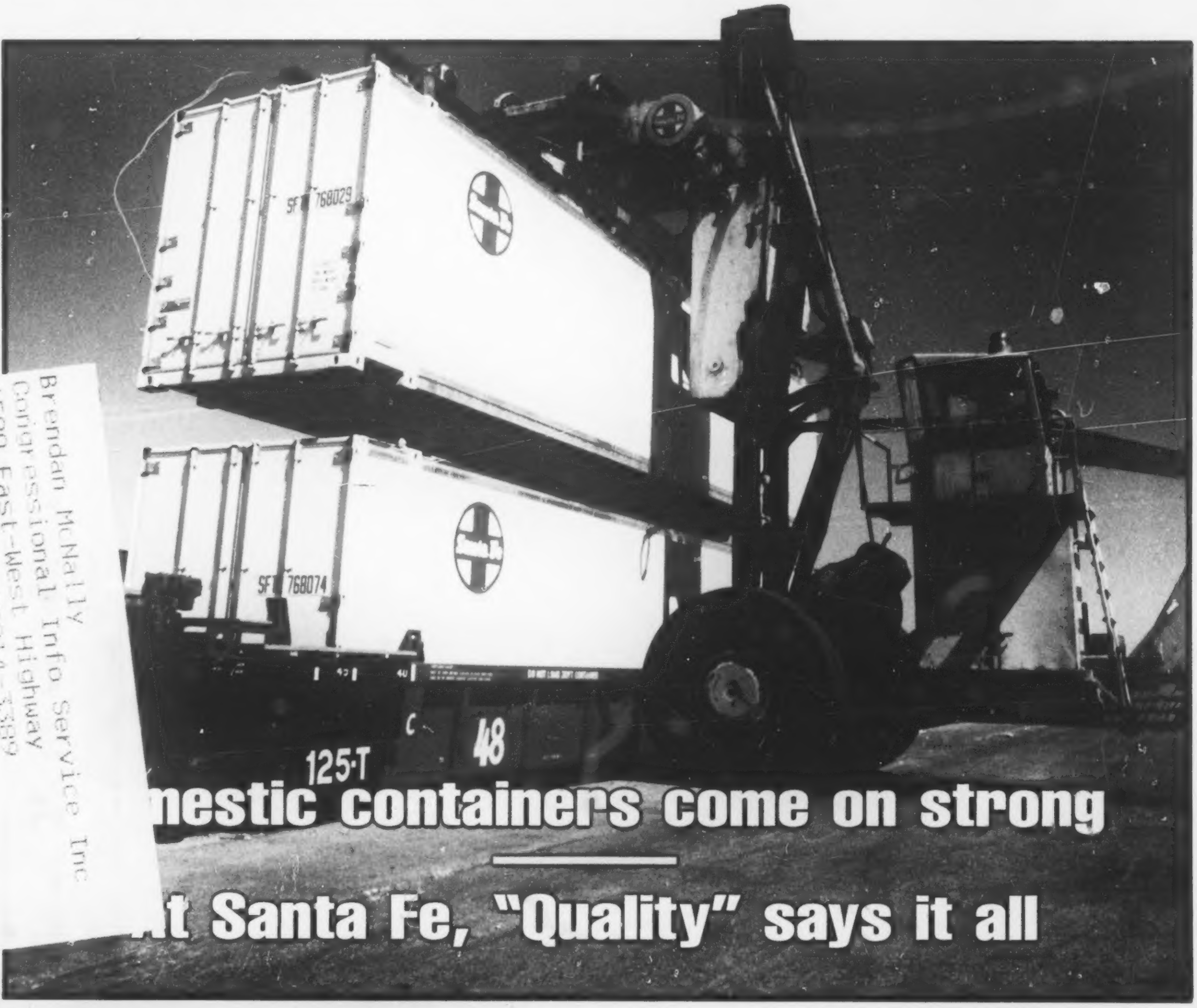

Brendan McNally
Congressional Info Service Inc
4520 East-West Highway
Bethesda MD 20814-3389

mestic containers come on strong

t Santa Fe, "Quality" says it all

Light Rail Planner's Guide

Regionals and short lines: A new market

Railway Age

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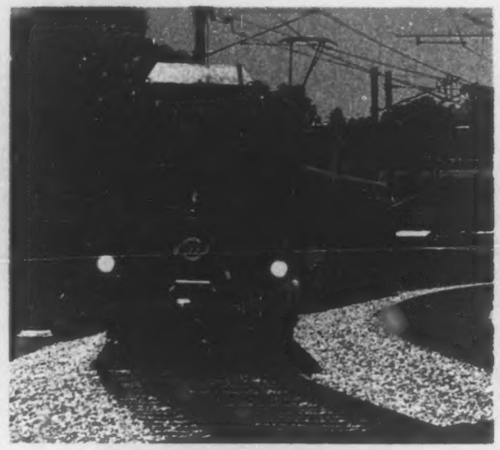

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INSIDE

Budgeting for growth

LUTHER S. MILLER

Capital improvement budgets are not the only indicator of an industry's state of health, but they tell us a lot about an industry's state of mind—whether it's pessimistic or optimistic. Examining Class I railroad capital budgets for 1989, you have to conclude that this industry is very optimistic indeed about its future.

The last of the major railroads have now reported their 1989 investment plans (p. 10); these along with previously reported programs add up to $4 billion. That compares with $3.5 billion in 1988 and $2.9 billion in 1987.

The hottest activity, as we have been predicting for some time, is in freight cars and locomotives. The biggest single capital budget is CSX Transportation's $763 million (up 34% over last year), and the biggest single item in the CSXT budget is $300 million for cars and locomotives. Norfolk Southern, another big spender whose plans are reported in this issue, has earmarked $295 million for equipment out of a total budget of $695 million (which is up 12% over 1988).

It should be emphasized that Class I railroad outlays do not tell the whole capital spending story. It is particularly important to keep this in mind at a time when the trend once again is toward investment in freight cars. The table reproduced below shows the rather remarkable shift that has taken place in the last ten years in freight-car ownership, and it suggests that private car lines, shippers and "other" railroads have become almost as big a force in freight-car buying as the Class Is.

FREIGHT CARS: A shift in ownership

Year	Total	Class I Railroads	Other Railroads	Car Companies and Shippers
1978	1,652,774	1,225,374	70,007	357,393
1979	1,699,322	1,217,079	91,427	390,816
1980	1,710,827	1,168,114	102,161	440,552
1981	1,672,465	1,111,115	101,091	460,259
1982	1,587,536	1,039,016	91,452	457,068
1983	1,542,278	1,007,165	91,395	443,718
1984	1,486,282	948,171	91,009	447,102
1985	1,421,686	867,070	111,086	443,530
1986	1,339,453	798,631	103,504	437,318
1987	1,288,129	748,523	107,223	432,383

Source: AAR Transportation Division.

As the table above suggests, one non-Class I group which exercises growing influence in the railway marketplace is that which the AAR calls "other" railroads. The article beginning on p. 39 reports on the results of a *Railway Age* survey of the spending plans of 25 short line and regional railroads.

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...for the new age of railways and rail transit

Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200
Fax: 212-633-1165

CHARLES H. ELLWANGER, Publisher
LUTHER S. MILLER, Editor

Publishing Director: Robert G. Lewis

Managing Editor: Judy McCusker
Engineering Editor: Art Slepian
Contributing Editors: John H. Armstrong, William D. Middleton
Art Director: Maurice H. Mates
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Graphics Coordinator: Pat Nash
Photo Editor: Kent Patterson

Production Manager: Tina Small
Circulation Director: John Scunziano
Circulation Fulfillment Manager: Marie Faranda

Western Editorial Offices
Chicago, Ill. 60604,
175 W. Jackson Boulevard, Suite A-1927
312/427-2729
Fax: 312-427-3014

GUS WELTY, Senior Editor
Intermodal Editor: Bill Fahrenwald
Editorial Assistant: Wanda Welty
Contributing Editor: F. K. Plous

International Offices
Falmouth, Cornwall, TR11 4RJ, England
P.O. Box 8
Telephone: 44-326-313945
Fax: 011-44-326-319066

International Editors: Michael Knutton, David Briginshaw

Arthur J. McGinnis, Jr., President
Simmons-Boardman Publishing Corp.

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MARKET OUTLOOK

Capital Expenditures

CSX Transportation: Has adopted a 1989 capital improvements program totaling $763 million, up 34% from 1988; it includes $300 million for new cars and locomotives and $238 million for roadway. (Details p. 17.)

Norfolk Southern: Will spend $695 million on capital improvements in 1989, a 12% increase over the $623 million budgeted for 1988. Approximately $400 million will go for roadway improvements and $295 million for equipment. (Details p. 17).

Southern Pacific: Has budgeted $361 million for capital improvements in 1989, including $113 million in lease acquisitions. SP's 1988 capital budget of $480 million included $67 million in lease acquisitions. The 1989 program earmarks $190 million for track improvements. (Details p. 17).

Union Pacific: Capital improvements in 1989 will total approximately $650 million, compared with $474 million in 1988. About $400 million will be invested in roadway projects. Further details were not immediately announced.

Equipment

Burlington Northern: Acquired 1,000 new 48-foot containers from Stoughton Trailer for BN America's new container service between the Pacific Northwest and Chicago which began Feb. 1 (*RA*, Jan., p. 13).

Massachusetts Bay Transportation Authority: Awarded a $16 million contract to Bombardier to overhaul and upgrade 18 commuter rail locomotives. The first rebuilt locomotive is to be delivered this fall.

International Transportation Services: Ordered five Transtainer stacking gantry cranes from Coast Engineering & Manufacturing Co. of Gulfport, Miss., a subsidiary of Fruehauf, for installation at its Long Beach, Calif., facility.

Facilities

METROREY (Monterrey, Mexico): Awarded a $3.5 million contract to Cubic Western Data of San Diego, Calif., to supply a fare collection system for 17 stations of a new commuter rail system.

New York City Transit Authority: Contracts have been awarded to Transco Industries of Portland, Ore., for the supply of trainwashers at Jamaica and Canarsie. Transco recently supplied a trainwasher to MARTA, the Metropolitan Atlanta Transit Authority.

Revenue freight carloadings

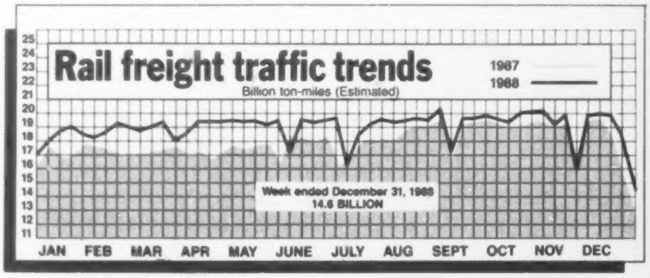
Commodity	Dec. 31 week	Dec. 24 week
Grain	20,694	28,460
Other farm products	3,000	3,898
Metallic ores	22,041	20,349
Coal	87,734	126,865
Crushed stone, gravel and sand	7,844	10,827
Nonmetallic minerals	7,736	8,411
Grain mill products	9,006	10,619
Food and kindred products	7,548	10,465
Primary forest products	7,184	9,897
Lumber and wood products except furniture	5,544	7,304
Pulp, paper and allied products	13,218	11,998
Chemicals and allied products	27,135	28,482
Petroleum products	4,380	5,108
Stone, clay and glass products	7,864	9,110
Coke	5,939	5,423
Metals and products	8,840	9,478
Motor vehicles and equipment	8,553	19,905
Waste and scrap materials	5,595	8,291
Forwarder and shipper assn. traffic	1,613	2,043
All other carloads	63,970	82,722
Total Cars Loaded	**325,438**	**419,655**
% change from previous year	7.9	40.0
Estimated revenue ton-miles (billions)	14.6	18.7
% change from previous year	7.7	37.7

Total:	**1988**	**1987**	**% change**
52 weeks	997.0	948.0	5.2

Piggyback loadings

	Dec. 31 week	Dec. 24 week	Dec. 17 week
Trailers/containers	86,9251	109,859	117,991

Cumulative total, 52 weeks		**% change from 1987**
Trailers/containers	5,716,293	3.9



Source: Association of American Railroads

Note to Readers:
Effective Jan. 1, the AAR has changed its method of reporting weekly traffic statistics. Intermodal traffic will no longer be included in carloadings and will be reported entirely separately. Ton-miles will be based on carloadings only, and while they will continue to be reported they will be de-emphasized as a leading traffic indicator. Statistics for the final weeks of 1988 are published in this issue, on the old reporting basis, to complete the 1988 record. Statistics based on the new method of reporting will be published beginning with the March issue; the AAR will restate 1988 statistics for comparability.

Small roads, big market

Twenty-five of the small carriers, representing about one-fourth of total short line and regional mileage, say they will spend $44 million-plus this year, with crossties a priority item.

Individually, the 1989 spending programs of short line and regional railroads range from modest to minuscule. Collectively, they add up to a big new market for railroad suppliers, though just how big nobody seems to know.

The Association of American Railroads maintains a comprehensive data bank for the Class I railroads, but its information on short lines and regionals is skimpier: They operate about 30,000 miles of line and they own around 8% of the freight car fleet. The American Short Line Railroad Association does not maintain extensive statistics because its members are not required to file the kind of comprehensive reports that the Class Is regularly feed to the ICC and the AAR. The Regional Railroad Association is conducting a survey of spending by its members, in order to buttress its position that these railroads play an increasingly important role in transportation economics, but that survey is incomplete.

A *Railway Age* survey of 25 short line and regional carriers shows that they plan expenditures in 1989 totaling $44.3 million, compared with $41.5 million in 1988. The railroads participating in this survey operate 7,150 miles of line, nearly one-fourth of the total short line and regional mileage. A simple extrapolation would suggest that total expenditures by these railroads would, therefore, be about four times the amount pinpointed in the *Railway Age* survey, or something approaching $200 million. But in the small-railroad business, where needs and the funding to meet those needs vary widely from property to property and from year to year, simple extrapolations don't add up to good economics.

The survey does, however, provide useful data on small-railroad spending priorities.

The biggest single expenditure in 1989, for example, will be $12.9 million for crossties, compared with $10.2 million in 1988. Another big item is grade crossing protection and surfacing, for which the 25 surveyed railroads plan to spend $6.8 million in 1989, vs $6.3 million in 1988. About $4.9 million will be spent for rail this year, up from $1.9 million in 1988. Expenditures will be relatively small for signaling ($230,000 in 1989 vs $125,000 in 1988) and communications ($63,600 in 1989, com-

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Among railroads surveyed, the 2,000-mile Wisconsin Central has the biggest improvement program for 1989, nearly $12 million.

pared with $56,900 in 1988).

Outlays for new and used freight cars and locomotives will be low for most of the surveyed railroads, with one or two railroads accounting for the big disparities in year-to-year comparisons. For example, the $8.4 million to be spent on car acquisition this year compares with a mere $180,700 reported for 1988; and the $580,000 projected for locomotives in 1989 compares with $7.7 million spent by these roads in 1988. Additional millions go for leasing.

The 1989 budgets reported to *Railway Age* ranged from a high of $11.66 million (by the 2,000-mile Wisconsin Central) to a low of $25,000 (by the 65-mile Ontario Midland). This was the road-by-road report:

—**Wisconsin Central, 2,000 miles: 1989, $11,660,000.** $7,300,000 for purchase of 250 used freight cars, $1,100,000 to repair 240 cars, $3,000,000 for 80,000 crossties, and $250,000 for grade crossing protection and surfacing. **1988, $13,875,000.** $650,000 for purchase of 85 used cars, $3,200,000 to lease 753 cars, $1,400,000 to repair 280 cars, $1,400,000 to repair 22 locomotives, $2,700,000 for 70,000 crossties, $1,100,000 to acquire 45 track machines, and $225,000 for grade crossing protection and surfacing.

—**New York, Susquehannah & Western, 430 miles: 1989, $9,719,000** (not including any outlays for freight cars). $800,000 for four miles of rail, $3,855,000 for 25 miles of welded rail, $1,000,000 for 25,000 ties, $333,000 for eight track machines, $30,000 for communications, $30,000 for signaling, $1,495,000 for grade crossing protection, and $2,178,000 for grade crossing surfacing. **1988, $9,393,666** (not including freight cars). $4,800,000 for four new locomotives, $1,600,000 for five used locomotives, $400,000 for two miles of rail, $200,000 for welded rail, $800,000 for 20,000 ties, $20,000 to purchase five track machines and $15,000 to lease eight track machines, $20,000 for communications, $450,000 for grade crossing protection, and $1,188,666 for grade crossing surfacing.

—**Dakota, Minnesota & Eastern, 965 miles: 1989, $4,695,000.** $1.1 million for locomotive repairs, $315,000 for welded rail, $2.5 million for 140,000 ties, $225,000 to purchase 13 track machines, $75,000 for grade crossing protection, $480,000 for grade crossing surfacing. **1988: $3,650,000.** $900,000 million for locomotive repairs, $2.1 million for 90,000 ties, $200,000 to buy 12 track machines, $150,000 for grade crossing protection, and $300,000 for grade crossing surfacing.

—**MidSouth Rail Corp., 1,150 miles: 1989, $3,900,000.** $600,000 to lease 250 freight cars, $800,000 for eight miles of rail, $800,000 for welded rail, $1,300,000 for 50,000 ties, $50,000 for two track machines, $200,000 for grade crossing protection, and $50,000 for grade crossing surfacing. **1988, $2,700,000.** $420,000 for leasing freight cars, $803,200 for purchase of 20 used locomotives, $1,367,600 for 52,600 ties, $80,000 for four track machines, $50,000 for grade crossing protection, and $30,000 for grade crossing surfacing.

—**Indiana Hi-Rail Corp., 133 miles: 1989, $2,641,000.** $75,000 for ten used freight cars, $80,000 for car repair, $396,000 to lease 100 locomotives, $100,000 to repair five locomotives, $450,000 for rail, $1,050,000 to install 35,000 ties, $15,000 to buy one track machine, $10,000 to lease one track machine, $15,000 for communications, $50,000 for signaling, $100,000 for grade crossing protection, and $300,000 to rebuild six grade

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crossings. **1988, $2,866,500.** $772,200 to lease 195 freight cars, $6,500 to buy one used freight car, $150,000 for nine used locomotives, $100,000 to repair five locomotives, $200,000 for a new locomotive shop, $70,000 for rail, $560,000 for 20,000 ties, $8,000 for a track machine, $15,000 for communications, $35,000 for signaling, $100,000 for grade crossing protection, and $700,000 to rebuild 12 grade crossings.

—**Washington Central, 400 miles: 1989, $2,106,000.** $800,000 for 40 used freight cars, $45,000 for rail, $875,000 for 25,000 ties, $45,000 to purchase four track machines, $40,000 to lease track machines, $1,000 for signaling, $300,000 for grade crossing protection. **1988, $698,000.** $7,500 for four used freight cars, $100,000 for two used locomotives, $30,000 for rail, $350,000 for 10,000 ties, $134,500 to buy 12 track machines, $6,000 for communications, and $70,000 for grade crossing surfacing.

—**Central Montana Rail, 66 miles: 1989, $1,745,000.** $1,400,000 for 20 miles of rail and $75,000 for 3,000 ties. **1988, $460,000.** $90,000 for rail, $320,000 for 30,000 ties, $5,000 for track machines.

—**Iowa Interstate, 662 miles: 1989, $1,660,000.** $100,000 for two leased locomotives, $650,000 for locomotive repairs, $810,000 for crossties, plus an undetermined amount for lease of 150 freight cars. **1988, $1,085,000.** $325,000 to lease 75 freight cars, $175,000 to buy five used locomotives, $180,000 to lease two locomotives, $405,000 for installation of crossties.

—**Arkansas & Missouri, 53 miles: 1989: $927,305.** $75,000 to buy 25 used freight cars, $20,000 to buy two used locomotives, $360,000 for locomotive repair, $35,000 for other equipment, $225,000 for 15,000 ties (materials only), $15,000 for a new track machine, $75,000 for leased track machines, $8,000 for communications, $15,000 for signaling, $94,305 for grade crossing protection, and $5,000 for grade crossing surfacing. **1988, $1,074,283.** $75,000 to buy 25 used freight cars, $130,500 to buy 12 used locomotives, $480,000 for locomotive repair, $35,000 for other equipment, $225,000 for 15,000 ties, $28,500 to buy three track machines, $34,400 for leased track machines, $62,883 for grade crossing protection, and $3,000 for grade crossing surfacing.

—**Lake Superior & Ishpeming, 55 miles: 1989, $858,000.** $400,000 to buy eight used locomotives, $150,000 for locomotive rebuild, $100,000 for rail, $45,000 for ties, $75,000 for a track machine, $3,000 for communications, $25,000 for grade crossing protection and $60,000 for grade crossing surfacing. **1988, $745,000.** $187,500 to repair 75 cars, $150,000 for locomotive rebuild, $200,000 for rail, $45,000 for ties, $160,000 for a track machine, $3,000 for communications.

—**Minnesota Commercial Railway, 63 miles: 1989, $701,000.** $60,000 for a used locomotive, $35,000 for locomotive repairs, $525,000 to upgrade track, $16,000 for a track machine, and $65,000 for signaling. **1988, $656,000.** $18,000 for nine used freight cars, $50,000 for a used locomotive, $30,000 for locomotive repairs, $491,000 for track and roadway (plus $18,000 for five track machines), $30,000 for signaling, and $19,000 for grade crossing surfacing.

—**Southeast Kansas Railroad, 104 miles: 1989, $680,000.** $100,000 for two used locomotives, $250,000 for other equipment, $70,000 for rail, $150,000 for

(Continued on p. 53)

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Small roads

(Continued from p. 43)

50,000 ties, $50,000 for track machines, $60,000 for grade crossing protection. **1988, $840,000.** $200,000 for four used locomotives, $250,000 for other equipment, $70,000 for rail, $150,000 for 50,000 ties, $50,000 for track machines, and $120,000 for grade crossing protection.

—**Florida Central, 60 miles: 1989, $605,000.** $20,000 for locomotive repairs, $240,000 for 6,000 ties, $30,000 for two track machines, $240,000 for grade crossing protection, and $75,000 for grade crossing surfacing. **1988, $456,000.** $30,000 for locomotive repairs, $40,000 to install 1,000 ties, $21,000 for a track machine, $320,000 for grade crossing protection, and $45,000 for grade crossing surfacing.

—**Knox & Kane, 78 miles: 1989, $447,600.** $237,600 for rail, $80,000 for 3,400 ties, $100,000 for grade crossing protection, and $30,000 for grade crossing surfacing. **1988, $119,500:** $12,000 for a used locomotive, $70,000 for 3,500 ties, $35,000 for two track machines, $2,500 for communications.

—**Providence & Worcester, 360 miles: 1989, $395,000.** $125,000 for a locomotive rebuild, and $270,000 for grade crossing protection. **1988, $526,000.** $14,000 for a used freight car, $35,000 for car repairs, $125,000 for a locomotive rebuild, and $353,000 for grade crossing protection.

—**Florida West Coast, 45 miles: 1989, $264,000** (in addition to leasing 85 freight cars). $90,000 for crossties, $35,000 for two track machines, and $9,000 for grade crossing surfacing. **1988, $136,000** (in addition to leasing 25 cars and three locomotives). $70,000 for seven used freight cars, $54,000 for crossties, $12,000 for three track machines.

—**South Branch Valley, 52.4 miles: 1989, $193,500.** $12,000 for locomotive repair, $15,000 for other equipment, $120,000 for rail, $40,000 for crossties, $5,000 for communications, and $1,500 for grade crossing surfacing. **1988, $436,900.** $2,300 for a used freight car, $14,500 for other equipment, $383,000 for rail (including 2.75 miles of cwr), $34,000 for crossties, and $3,100 for grade crossing surfacing.

—**Alabama & Florida, 80 miles: 1989, $145,000.** $15,000 for locomotive repair, $70,000 for crossties, $60,000 for grade crossing protection. **1988, $519,000.** $105,000 for seven used locomotives, $80,000 for locomotive repairs, $140,000 for crossties, $25,000 for two track machines, $94,000 for grade crossing protection, and $75,000 for grade crossing surfacing.

Dakota, Minnesota & Eastern purchased a new Jackson 950 crane and a 925 tie remover/inserter for a five-year, $20 million track improvement program that calls for 295,000 new crossties, 314,000 tons of ballast, and relaying five miles with cwr.

—**St. Maries River, 71 miles: 1989, $326,000.** $36,500 to lease 20 cars, $30,000 for car repairs, $12,000 for other equipment, $43,000 for rail, $160,000 for crossties, $20,000 for one track machine, $5,000 to lease one track machine, and $20,000 for grade crossing surfacing. **1988, $176,800.** $14,000 for miscellaneous equipment, $42,000 for rail, $130,000 for crossties, $19,500 for three track machines, $70,000 for grade crossing protection, and $30,000 for grade crossing surfacing.

—**Montana Western, 52 miles: 1989, $272,000.** $125,000 to rebuild a locomotive, $6,000 for other equipment, $120,000 for crossties, and $21,000 to lease five track machines. **1988, $237,000.** $14,000 for miscellaneous equipment, $161,000 for crossties, $17,000 for a track machine, $20,000 to lease five track machines, $20,000 for grade crossing protection, and $5,000 for grade crossing surfacing.

—**South Carolina Central, 52 miles: 1989, $260,000.** $20,000 for locomotive repairs, $100,000 for rail, $105,000 for 4,800 crossties, $4,500 for a track machine, and $30,000 for grade crossing surfacing. **1988, $120,000:** $12,000 for locomotive repair, $88,000 for 4,000 crossties, and $20,000 for grade crossing surfacing.

—**Ann Arbor, 53.5 miles: 1989, $126,000.** $30,000 for crossties, and $96,000 for signaling. **1988, $320,000:** $7,500 for crossties, $8,000 for communications, $60,000 for signaling, $48,000 for grade crossing protection, and $197,000 for grade crossing surfacing.

—**Green Mountain Railroad, 50 miles: 1989, $115,600.** $50,000 for locomotive repair, $60,000 for crossties, $2,600 for communications, and $3,000 for grade crossing surfacing. **1988, $188,400:** $150,000 for five leased locomotives, $1,500 for locomotive repair, $18,500 for crossties, $16,000 for lease of track machines, and $2,400 for communications.

—**Louisiana & Delta, 100 miles: 1989, $67,000.** $22,000 for tie maintenance, $18,000 for purchase of one track machine, $9,000 for lease of three track machines, and $18,000 for signaling. **1988, $92,000.** $29,000 for tie maintenance, $54,000 for a track machine, and $9,000 to lease three track machines.

—**Ontario Midland, 65 miles: 1989, $25,000.** $10,000 for crossties, $10,000 for grade crossing protection, and $5,000 for grade crossing surfacing. **1988, $70,000.** $5,000 for locomotive repair, $40,000 for crossties, $10,000 to lease one track machine, $10,000 for grade crossing protection, and $5,000 for grade crossing surfacing. ■

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March 1989

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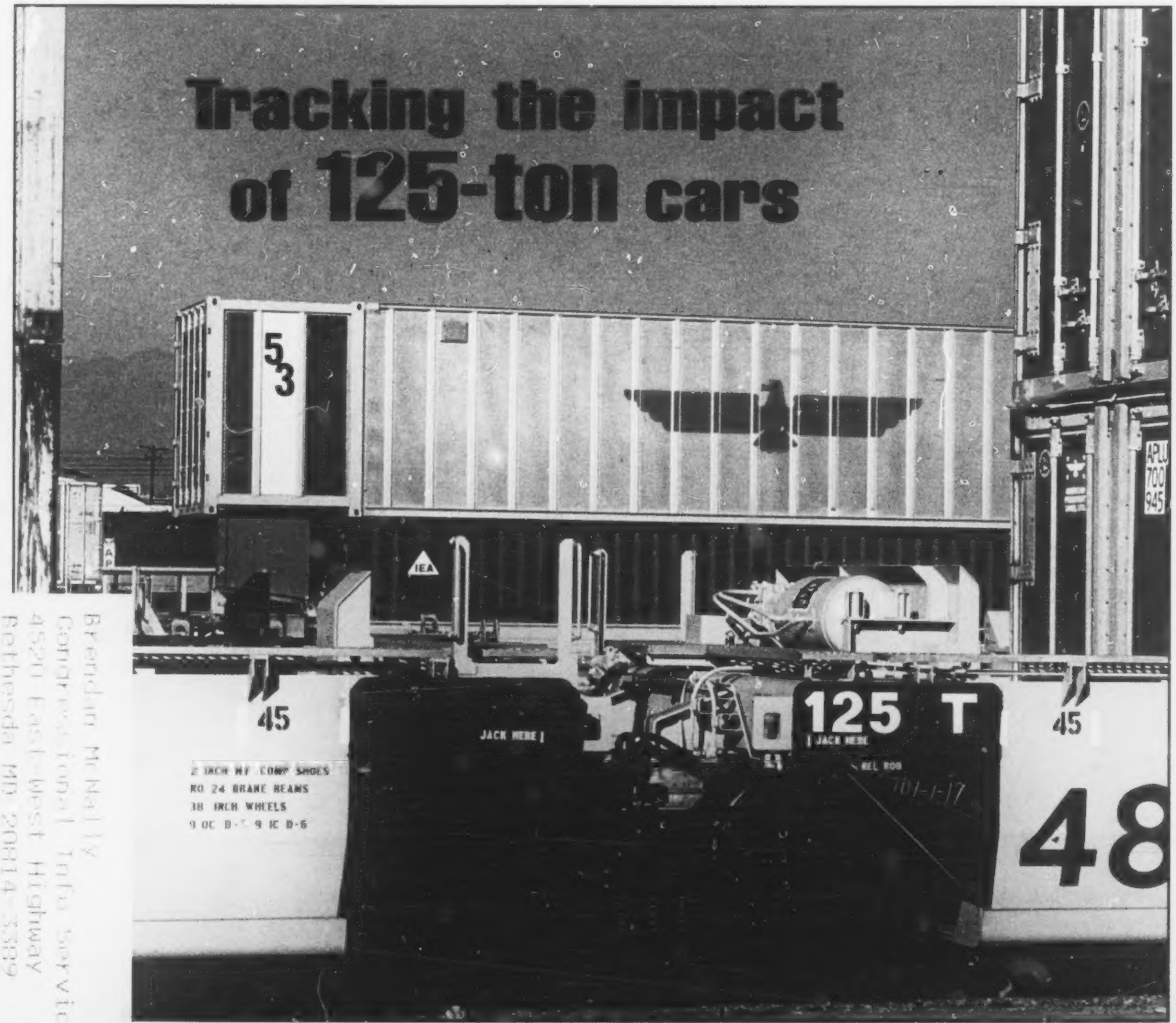
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Tracking the impact of 125-ton cars

Brendan McNally
Congressional Info Service Inc
4520 East-West Highway
Bethesda MD 20814-3389
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The new locomotives: Macro benefits from microprocessors

BART boosts ridership with savvy marketing

Railway Age

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March 1989

Features

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Cover photo by Bruce Harmon

25 Tracking the impact of 125-ton cars

The occasional heavy car (in a stack train, for example) is one thing—but solid trains of them, pounding the same track day after day, could present problems.

33 Track tester takes shape

The Track Loading Vehicle, developed at the Chicago Technical Center and soon to be checked out at Pueblo, could be one of the most important research tools in the m/w kit.

35 Macro benefits from microprocessors

Onboard computers give new generation locomotives great diagnostic and archival capability. Learning to use this mass of data effectively is the next step.

41 ATCS advances in Canada

An intermediate (Level 20) system will be installed by Canadian National in B.C. What distinguishes the CN approach from some others is that it's "spec-compliant."

45 How BART won riders back

After a whopping fare increase, Bay Area Rapid Transit ridership slumped. A savvy marketing campaign, featuring comic Henny Youngman, has helped reverse the downtrend.

49 Amtrak adopts standard radios

Train crews who used a variety of communications equipment when employed by individual railroads now have 48-channel radios (a total of 1,200) supplied by GE.

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MARKET OUTLOOK

Equipment

Chicago & North Western: Ordered 30 DASH 8-4DC diesel-electric locomotives from General Electric at a cost of about $40 million. The units, to be used in Wyoming coal service, are scheduled for third quarter delivery.

Facilities

Canadian National: Will invest $2.1 million to upgrade its locomotive test facility at Transcona Shops, Winnipeg, as part of a modernization of the shop complex that will cost about $5 million in 1989. All overhaul and subsequent test activity involving CN locomotives built by General Motors has been consolidated at Transcona, resulting in a greater volume of work. CN's existing load test building will be extended to accommodate longer, new-generation locomotives and a track will be added to handle the increased number of units to be tested.

Chicago Transit Authority: Power Energy Industries (PEI) of Carson, Calif., will supply rectifiers and rectifier transformers for 15 traction power substations that will be used on the CTA's new Southwest Line. The $2.2 million contract was awarded to PEI by principal contractor ABB Traction Inc. of Lawrenceville, N.J.

Egyptian State Railways: Awarded a $6.4 million add-on contract to Aydin Corp., which is completing a telecommunications network for train traffic control. The add-on work, which will be performed at Aydin Corp. (West) in San Jose, Calif., consists of expanding certain links of the network and increasing the capacity of certain telephone lines.

Metro-North: Awarded a contract to DSL Dynamic Sciences Limited for the design, supply, and installation of three locomotive simulators. DSL President Dr. John Wilson said completion of this order will bring the total number of DSL simulators in service to ten.

Norfolk Southern: Acquired two new mainframe computers for its Atlanta computer center, an IBM 3090-400S and an Amdahl 5990-700, at a cost of $17 million. The new computers increase NS's central data processing capacity by 120%.

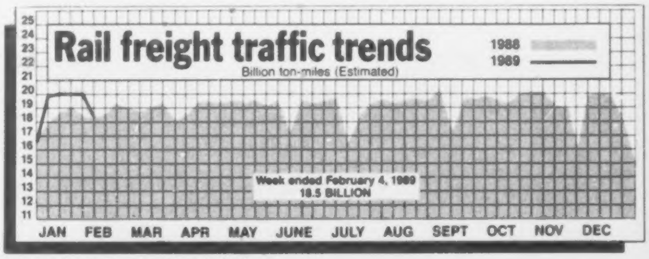
Revenue freight carloadings

Commodity	Feb. 4 week	Jan. 28 week	Jan. 21 week	Jan. 14 week	Jan. 7 week
Grain	30,746	32,273	31,644	31,646	25,032
Other farm products	2,380	2,608	2,439	2,404	2,202
Metallic ores	12,511	14,242	8,582	16,337	20,087
Coal	111,416	125,338	121,385	126,530	104,028
Crushed stone, gravel and sand	11,255	12,016	11,797	11,863	9,749
Nonmetallic minerals	8,558	8,340	8,807	10,167	8,750
Grain mill products	10,243	10,546	10,578	10,546	9,360
Food and kindred products	8,741	9,333	8,885	9,346	7,818
Primary forest products	9,487	10,100	8,938	9,625	8,669
Lumber and wood products except furniture	6,978	7,401	6,820	6,626	5,294
Pulp, paper and allied products	11,045	10,809	9,607	10,755	11,261
Chemicals and allied products	29,220	28,554	28,008	29,635	25,144
Petroleum products	4,891	5,121	4,903	5,471	4,375
Stone, clay and glass products	9,306	9,887	9,109	8,977	8,081
Coke	5,770	5,612	5,651	6,026	5,693
Metals and products	10,426	10,595	8,839	9,937	8,411
Motor vehicles and equipment	21,367	21,512	21,676	21,368	14,208
Waste and scrap materials	8,973	9,289	8,860	9,405	6,757
Forwarder and shipper assn. traffic	9	13	11	10	6
All other carloads	6,836	7,613	6,414	7,125	5,490
Total Cars Loaded	**320,158**	**341,202**	**322,953**	**343,799**	**290,415**
% change from previous year	(0.6)	2.3	7.1	6.0	(4.4)
					% change
Cumulative total: 5 weeks		1,637,454			1.2
Estimated revenue ton-miles (billions)	18.5	20.0	20.0	19.9	16.6
% change from previous year	(.5)	4.2	3.6	6.4	(5.1)
Total:		**1989**	**1988**		**% change**
5 weeks		95.0	93.4		1.7

Intermodal traffic

	Feb. 4	Jan. 28	Jan. 21	Jan. 14	Jan. 7
Trailers	68,308	68,805	65,791	63,997	52,454
Containers	45,279	45,559	46,388	45,159	34,548
Total	**113,587**	**114,364**	**112,179**	**109,156**	**87,002**
% change from previous year	1.0	1.7	2.4	3.1	(7.1)

		% change
Cumulative total: 5 weeks	536,288	.4



Source: Association of American Railroads

Freight cars

	DELIVERED 4th quarter 1988	DELIVERED 4th quarter 1987	ORDERED 4th quarter 1988	ORDERED 4th quarter 1987	ON ORDER AND UNDELIVERED Jan. 1 1989	ON ORDER AND UNDELIVERED Jan. 1 1988
Built new by carbuilders	7,864	3,912	8,044	5,913	15,953	6,736
Built new in RR shops	0	0	0	0	0	0
Built new—Total	7,864	3,912	8,044	5,913	15,953	6,736
Rebuilt	143	27	0	207	18	0
TOTAL	**8,007**	**3,939**	**8,044**	**6,120**	**15,971**	**6,736**
Locomotives (new and rebuilt)	267	75	N/A	N/A	256	35

Source: Transportation Div., AAR and American Railway Car Institute

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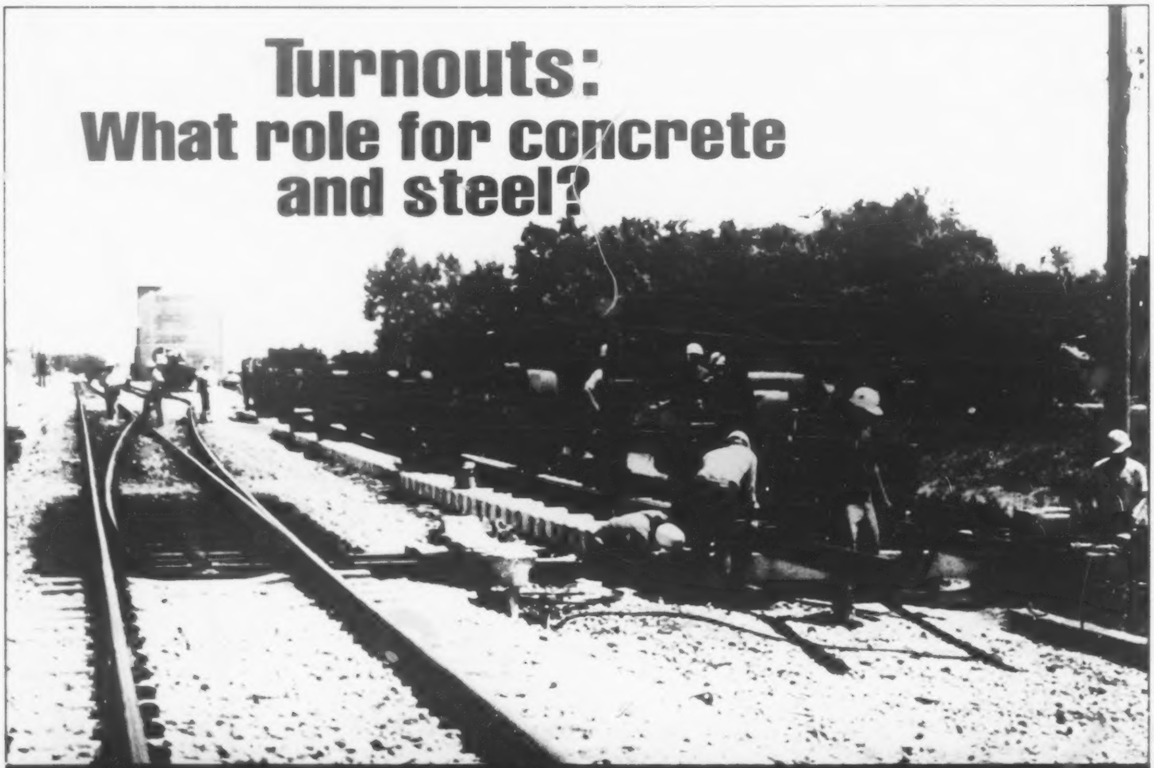

Turnouts: What role for concrete and steel?

Equipment Finance '89

North American commuter railroads

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Equipment Finance '89

Freight cars: Boom or blip? ..35

Temple, Barker & Sloane's William J. Rennicke and Anthony A. Davis survey the outlook for equipment supply and demand, assess the likely strategic response of railroads and equipment manufacturers, and examine the implications for overall capacity and production. They foresee orders over the next five years averaging two or three times the levels of the early '80s.

Lease vs buy: The options 38

More than 500,000 cars are now covered by various types of leases, and the trend is accelerating. "There is no best way to add equipment to your operations," advises Gerald D. Birmingham of GE Railcar Capital Services. "Each situation is different and, more than likely, there are several solutions to get you the equipment you need for an acceptable price."

29 What's new in turnouts

BN is finding that concrete-tie turnouts with swing-nose frogs permit increased speeds (to 35 mph). Steel-tie turnouts are also in the picture. In its quest for 60-mph turnouts, BN is increasingly looking to European technology.

30 Commuter roads: Old lines, new challenges

In Part I of a road-by-road survey, William D. Middleton examines the operations and the multi-billion-dollar expansion plans of commuter operating agencies in Boston, metropolitan New York/New Jersey, and Philadelphia.

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INSIDE

An accelerating game of catch-up

LUTHER S. MILLER

In Montreal this month, several hundred of the people who buy, build, lease, and finance freight cars and locomotives will gather at the Queen Elizabeth Hotel to probe the state of the railway equipment industry and to try to chart its course in coming months and years. The April 9-13 sessions—sponsored by a broad-based group of supply industry companies, including *Railway Age*—will examine motive power trends (April 9-10), freight cars in general (April 11-12), and grain cars (April 12-13), all under the rubric of Rail Equipment Finance '89.

These sessions will be, in effect, a continuation of an extraordinarily well-attended and stimulating conference that took place last June in St. Louis (*RA*, July 1988, p. 41). Again this year Anthony D. Kruglinski will be the general moderator. Until recently, Kruglinski was vice president and general manager of the Transport Department of the Irving Trust Co. He now heads his own company, the Railroad Financial Corp. based in Princeton N.J. (He also makes his debut this month as a regular *Railway Age* columnist; see p. 17.)

Last year's conference ended on a cautiously upbeat note: The freight-car and locomotive markets appeared to be coming back, after years in the doldrums.

What has happened in the ensuing year has given rise to even more optimism (though "cautious" is still a necessary qualifier, as Bill Rennicke and Anthony Davis of Temple, Barker & Sloane point out in their article, "Freight cars: Boom or blip?" in this issue, p. 35).

Deliveries of new and rebuilt locomotives last year—531—were higher than the most optimistic forecasts. This year they will exceed 700 and they could soon approach 1,000. (The hot news in locomotives is not all in numbers: A major western road is expected soon to announce an order for half a dozen or more freight locomotives equipped with a.c. propulsion—a "first" in the U.S. that could signal a major motive power revolution.)

The freight car numbers also look good, better than anyone expected at St. Louis last year. Deliveries rose to more than 22,500 last year, up from a low of 5,772 in 1983. Expert forecasts now call for 30,000 cars delivered in 1989, though the official forecast of the American Railway Car Institute is still around 24,000.

There's even talk that a shrunken U.S. freight car building industry cannot meet the demand—that we may have to import cars from Mexico and Canada and even from Korea and Rumania. There is already, in fact, some importing of railcar kits, and there will be more, but domestic capacity right now is not a problem. A greater problem is the tightening supply of structural steel and certain car components, though no critical shortages are reported.

The biggest carbuilder, Trinity Industries, says it's "about 75% to 80% sold out through 1989," with some lines—for plastic pellet cars, for example—booked into 1990. L. Clark Wood, vice president and director of railcar sales, says activity has also been strong in tank cars, coal cars and auto racks. Trinity expects its overall car production to increase by 25% to 30% this year.

"Business is good," confirms Leonard Sis, Thrall Car's vice president sales and marketing. "We're not at capacity but we're close. We still have some space in the third and fourth quarters."

Business is also booming in the leasing business. About 500,000 freight cars of all types are under various types of lease, and the numbers are rising. The leasing options are explored in an article in this issue by Gerald D. Birmingham, senior vice president, sales and marketing, GE Capital Railcar Services (p. 38).

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Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200
Fax: 212-633-1165

ARTHUR J. McGINNIS, Jr.,
President and Publisher
LUTHER S. MILLER, Editor

Publishing Director: Robert G. Lewis

Managing Editor: Judy McCusker
Engineering Editor: Art Slepian
Contributing Editors: John H. Armstrong,
William D. Middleton
Art Director: Maurice H. Mates
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Photo Editor: Kent Patterson

Production Manager: Tina Small
Circulation Director: John Scunziano
Circulation Fulfillment Manager: Sheila Sullivan

Western Editorial Offices
Chicago, Ill. 60604,
175 W. Jackson Boulevard, Suite A-1927
312/427-2729
Fax: 312-427-3014

GUS WELTY, Senior Editor
Intermodal Editor: Bill Fahrenwald
Editorial Assistant: Wanda Welty
Contributing Editor: F. K. Plous

International Offices
Falmouth, Cornwall, TR11 4RJ, England
P.O. Box 8
Telephone: 44-326-313945
Fax: 011-44-326-319066

International Editors: Michael Knutton,
David Briginshaw

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RPRA Railroad Public Relations Association

MARKET OUTLOOK

Equipment

Chicago Transit Authority: New York Rail Car Corp. is rebuilding 136 2200 Series CTA cars at its facility at the Brooklyn Army Terminal. The company last year submitted a low bid of $553,000 per pair of cars for the work.

Conrail: Placed a $133-million order with General Electric for 100 4,000-hp C40-8 locomotives to be delivered in 1990.

Maryland Department of Transportation: Awarded a $61-million contract to ABB Traction Inc. for 35 articulated light rail vehicles, for the Mass Transit Administration in Baltimore, with an option for an additional 10-20 LRVs. The first vehicle is scheduled for delivery in December 1990.

Massachusetts Bay Transportation Authority: Ordered an additional 51 commuter coaches from Bombardier Inc. of Montreal at a cost of approximately $46 million, exercising an option that was part of a 1988 contract under which MBTA ordered 56 cars. The total contract is valued at more than $90 million. First deliveries are to be made this summer. Bombardier's first order from MBTA came in February 1987; it was for 40 push-pull commuter coaches, all now in service. The new coaches will be manufactured at Bombardier's plants in La Pocatiere, Que., and Barre, Vt. They are similar to cars which Bombardier has built for NJ Transit, Metro-North, and the Southeastern Pennsylvania Transportation Authority.

New Jersey Transit: Exercised an option to purchase three additional locomotives under an existing contract with ABB Traction Inc, bringing the total number on order to nine. Total value of the order is $41 million, with the first locomotive scheduled for delivery in February 1990.

Port of Seattle: Ordered three PACECO 5045 spreaders from Coast Engineering & Manufacturing Co., a subsidiary of Fruehauf. The spreaders, which are capable of picking up 20/40/45-foot containers, will be delivered by this summer.

Santa Fe: Ordered 425 on-board flange lubricators from TSM for installation this year.

Taipei (Taiwan): Alsthom of France has awarded a $4 million contract to the Brooklyn, N.Y., firm of Nemko, Inc. for assembly of 60 automated transit cars which Alsthom and Matra Transit, Inc. are supplying for a new seven-mile people-mover line in Taipei.

Facilities

CP Rail: Will begin construction this summer of a $29 million (Canadian), 200 acre intermodal terminal in Vaughan, Ont., northwest of Toronto. The new terminal will primarily handle Western Canadian domestic traffic as well as marine containers to and from western ports. The Obico terminal at Toronto will continue to handle import/export container traffic to and from eastern ports and domestic business for Eastern Canada and the U.S. The Vaughan terminal will have four 2,000-foot working tracks under three cranes along with six storage and makeup tracks of similar length. It will have two 5,000-foot lead tracks from the CP Rail main line and a wye track from the main line.

Revenue freight carloadings

Commodity	Mar. 4 week	Feb. 25 week	Feb. 18 week	Feb. 11 week
Grain	33,284	29,296	32,691	28,827
Other farm products	1,526	1,465	1,631	1,657
Metallic ores	13,263	12,046	12,499	12,718
Coal	127,192	124,466	124,362	115,624
Crushed stone, gravel and sand	11,869	10,955	12,000	9,643
Nonmetallic minerals	9,316	9,226	9,554	8,932
Grain mill products	9,657	9,707	10,287	10,124
Food and kindred products	9,035	8,806	9,312	8,485
Primary forest products	9,293	8,734	9,720	8,446
Lumber and wood products	7,234	6,913	6,782	6,004
Pulp, paper and allied products	11,134	10,697	10,811	10,448
Chemicals	28,359	26,754	28,293	26,076
Petroleum products	5,211	4,508	5,007	4,436
Stone, clay and glass products	9,196	8,632	9,490	8,632
Coke	5,817	5,428	5,352	5,553
Metals and products	10,764	9,799	9,551	9,129
Motor vehicles and equipment	21,494	21,514	22,113	20,970
Waste and scrap materials	9,264	8,800	9,621	8,912
Forwarder and shipper assn. traffic	7	5	8	5
All other carloads	6,977	6,847	7,370	24,058
Total Cars Loaded	339,892	324,697	336,464	327,261
% change from previous year	1.3	(4.7)	3.0	2.2%

		% change
Cumulative total: 9 weeks	2,947,882	.2

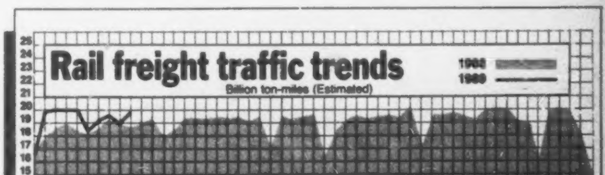
	Mar. 4	Feb. 25	Feb. 18	Feb. 11
Estimated revenue ton-miles (billions)	19.8	18.9	19.6	19.1
% change from previous year	2.1	(4.1)	3.7	2.1

Total:	1989	1988	% change
9 weeks	172.3	170.0	1.4

Intermodal traffic

	Mar. 4	Feb. 25	Feb. 18	Feb. 11
Trailers	71,063	65,539	68,748	65,823
Containers	45,717	46,650	49,533	45,520
Total	116,780	112,189	118,281	111,343
% change from previous year	.0	(1.9)	8.3	(.2)

		% change
Cumulative total: 9 weeks	994,881	.9

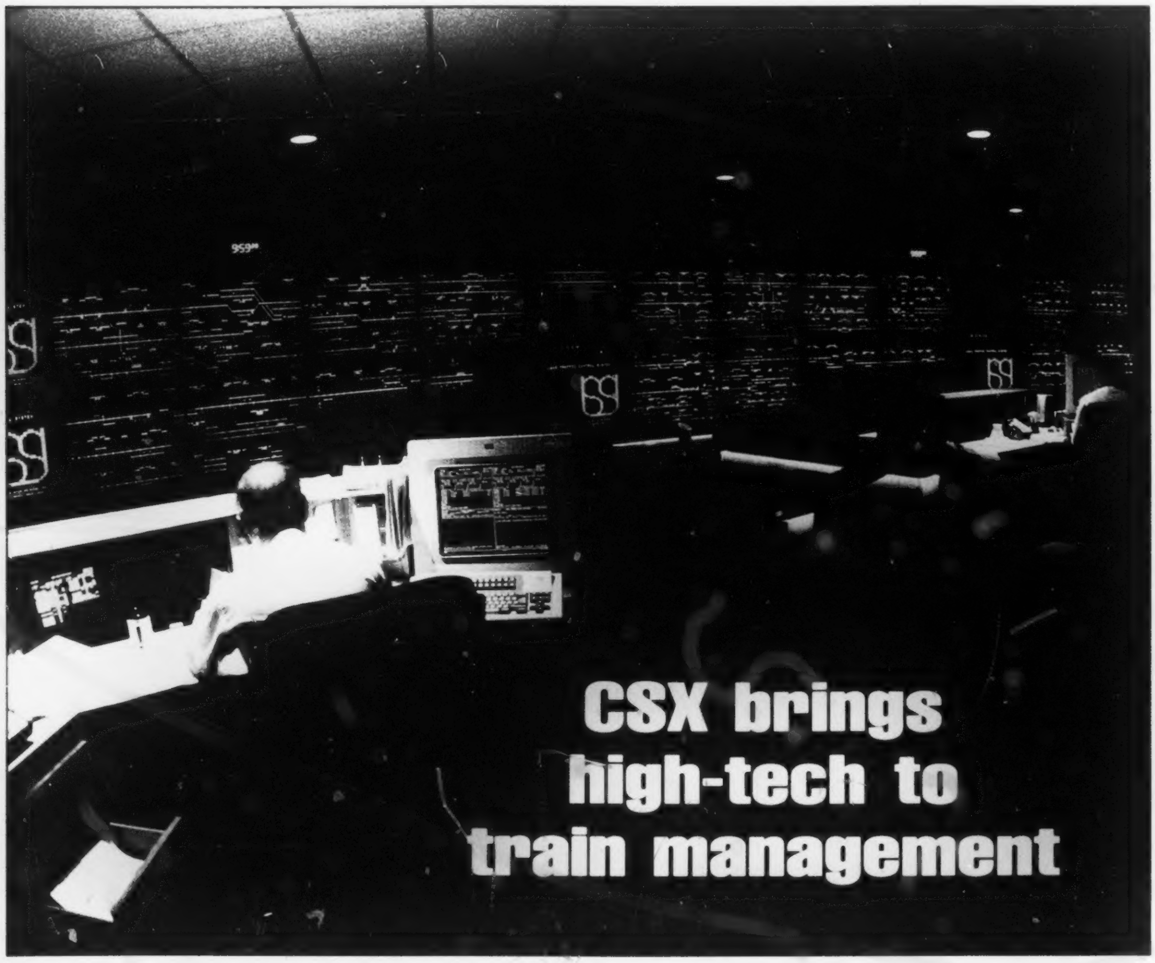


Source: Association of American Railroads

May 1989

Railway Age

...for the new age of railways and rail transit



CSX brings high-tech to train management

Mass transit: Boom times for builders

At BN, new efficiencies in coal transportation

Regional Railroad Planner's Guide

May 1989

Railway Age

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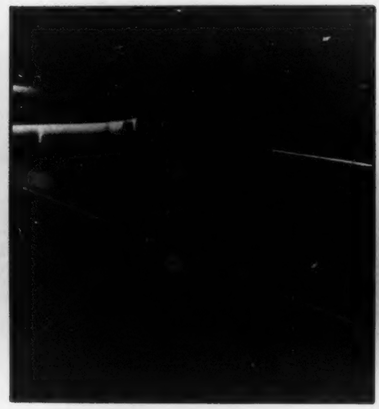

39 CSX: "Welcome to the 21st Century"

A new US&S-equipped operations center at Jacksonville permits CSX Rail Transport to monitor and control trains over virtually its entire 20,000 mile system. Crew-calling has also been centralized and computerized.

43 Coal-hauling, western style

Burlington Northern may not have written the book on coal transportation, but it has written a new chapter in coal-hauling efficiency with the help of its mines and its customers.

49 Equipment: Still playing catch-up

Orders for new cars and locomotives continue to rise, and rebuilding is going on at a fast pace; but shortages still loom. Power supply and grain car availability came in for special attention at Equipment Finance '89.

55 Transit cars: A bull market

Passenger railcar builders from half a dozen countries are divvying up a U.S. market that is expected to keep growing through the '90s. The rebuild business is also brisk.

61 Commuter roads: Suburban services flourish

In Part II of a road-by-road survey, Contributing Editor William D. Middleton covers systems ranging from MARC to Montreal and finds growth to be the common denominator.

81 Regional Railroad Planner's Guide

Railway Age examines the experiences of three new regionals and one old-timer and finds that they hold important lessons for start-up entrepreneurs. Also included in the Guide: A cross-indexed directory of consultants, suppliers, and others who can be helpful before, during, and after start-up.

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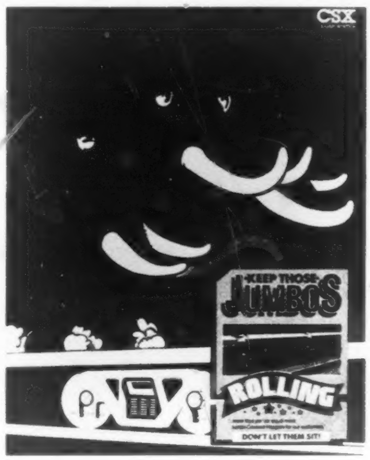
INSIDE

CSXT takes on a jumbo-sized task

LUTHER S. MILLER

When railroads, shippers, and private car owners get together and the talk turns to grain car availability, tempers tend to flare and patience runs thin. At the Equipment Finance '89 conference in Montreal last month (p. 49), CSX Transportation's vice president-marketing, Aden C. Adams, suggested that it's time for both sides to cool the rhetoric; to stop trying to solve car shortages with lawyers and lobbyists; and to work together at the difficult task of insuring an adequate supply of costly cars in a cyclical marketplace.

Better utilization of existing equipment has to be a big part of the solution, said Adams, and he added that it's going to require herculean efforts on the part of both carriers and shippers. For one thing, he said, shippers are going to have to stop holding cars as long as they now hold them if turnaround is going to be improved.



Adams was not speaking in the abstract. CSXT has already embarked on such an effort. The first visible sign of it is reproduced here, a "Keep Those Jumbos Rolling" poster promotion designed to drive home to the railroad's employees and its customers the importance of working covered-hopper cars harder.

Said Jim Howarth, assistant vice president, agricultural products: "The visual image is humorous and eye-catching. But the message is quite serious. Using the 'jumbos' more efficiently is critical because the freight car fleet is aging and shrinking. Improving utilization is a low-cost way to add real capacity to the 'jumbo' fleet. This approach is especially attractive when one new car can cost as much as $45,000."

What CSXT has in mind is far more than a poster-oriented public relations campaign. "We have a strong operating team in place," said Howarth. "Jim Quinlan, director of covered hopper fleet utilization, is doing an excellent job. The key to further improvement is to enhance the value of efficient operations by adding capacity and offering incentive programs that strengthen the customer's business by encouraging better utilization."

CSXT is adding capacity by buying 2,000 new covered hoppers and repairing 1,600 others during 1989.

CSXT's incentive programs include "sharing the cost of expanding facilities to accept 15 and 65 car blocks of cars and increasing penalties after four days of free or low-cost time to load and unload cars." Costs for extra days are rising from $60 to $100.

CSXT has named a manager-service design, Linda Olsen, to search out speed-up opportunities, and has assigned another officer, Keith Douglas, to monitor the movements of privately owned jumbo hoppers.

Nobody says it's going to be easy—but the bottom line says that it can be worth the effort.

"If each of CSXT's cars makes just two more trips a year, customers can load 24,000 more cars annually," says Howarth.

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Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200
Fax: 212-633-1165

ARTHUR J. McGINNIS, Jr.,
President and Publisher
LUTHER S. MILLER, Editor

Publishing Director: Robert G. Lewis

Managing Editor: Judy McCusker
Engineering Editor: Art Slepian
Contributing Editors: John H. Armstrong,
William D. Middleton
Art Director: Maurice H. Mates
Graphics Director: Diana Line
Graphics Coordinator: Pat Nash
Photo Editor: Kent Patterson

Production Manager: Tina Small
Circulation Director: John Scunziano
Circulation Fulfillment Manager: Sheila Sullivan

Western Editorial Offices
Chicago, Ill. 60604,
175 W. Jackson Boulevard, Suite A-1927
312/427-2729
Fax: 312-427-3014

GUS WELTY, Senior Editor
Intermodal Editor: Bill Fahrenwald
Editorial Assistant: Wanda Welty
Contributing Editor: F. K. Plous

International Offices
Falmouth, Cornwall, TR11 4RJ, England
P.O. Box 8
Telephone: 44-326-313945
Fax: 011-44-326-319066

International Editors: Michael Knutton,
David Briginshaw

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MARKET OUTLOOK

Equipment

Canadian National: Placed a $35 million (Canadian) order with National Steel Car Co. for 500 new 50-foot pulpwood cars that will have plug doors and steel linings and floors and will be vented.

Massachusetts Bay Transportation Authority: Awarded a $105.1-million contract to Nissho Iwai and Kawasaki for 75 double-decker commuter coaches, with an option for 70 aditional units. Deliveries will begin in 1990 and are to be completed by the end of 1991.

Trailer Train: Placed a $55.1 million order with Bethlehem Steel and Trinity Industries for 2,000 all-purpose articulated platforms for third quarter delivery. TT also ordered 900 double-stack wells, 750 from Gunderson and Thrall and 150 from Trinity. In the Gunderson/Thrall order, each well will be 48 feet in length with 20-foot container-carrying capacity in each well. The Trinity units will have 40-foot end wells with 20-foot container-carrying capacity and 48-foot intermediate wells. All will have 125-ton trucks.

United States Rail Services, Inc.: Placed a $27.25 million order with Trinity Industries for 500 plastic-lined covered hopper cars, with deliveries scheduled for second-half 1989. USRS, a subsidiary of U.S. Leasing, will lease the cars to chemical companies for the shipment of dry plastic materials. The USRS fleet currently numbers about 7,500 units.

Facilities

Bay Area Rapid Transit: Directors approved a contract valued at an estimated $17.839 million with Bay Area Transit Consultants, a joint venture, for general engineering and construction management for the Pittsburg, Warm Springs, Colma, and Dublin Canyon extensions. Work is to begin on all extensions by 1991. The joint venture consultants are Bechtel Civil, Inc.; Parsons Brinckerhoff, Quade and Douglas; Don Todd Associates; and J. Warren and Associates.

Connecticut DOT: Will acquire a 45-acre rail yard in New Haven, Conn., from Amtrak for $15.2 million and will invest $20 million over the next five years to modernize the maintenance facility.

CSXT/SP: Entered into a joint development agreement to construct a number of bulk distribution terminals throughout SP's 15-state system modeled after the 55 Bulk Intermodal Distribution Services (BIDS) terminals which CSXT has built on its own lines. The railroads will also jointly develop terminals at commonly served locations.

Dakota, Minnesota & Eastern: Will spend $9 million to upgrade 362 miles of main line between Rapid City and the Minnesota state line near Elkton, S.D., in order to raise maximum speeds to at least 25 mph over most of the line.

Revenue freight carloadings

Commodity	Apr. 8 week	Apr. 1 week	Mar. 25 week	Mar. 18 week	Mar. 11 week
Grain	32,523	32,152	30,003	32,344	31,045
Other farm products	2,304	1,751	1,627	2,110	1,773
Metallic ores	19,719	19,195	16,015	14,489	15,078
Coal	125,486	124,153	127,962	128,148	119,525
Crushed stone, gravel and sand	14,830	14,162	13,441	13,357	10,139
Nonmetallic minerals	9,524	9,825	9,014	9,350	8,695
Grain mill products	10,208	9,532	9,460	9,730	10,240
Food and kindred products	8,458	8,545	8,209	8,813	8,574
Primary forest products	9,285	9,609	8,945	10,248	8,877
Lumber and wood products	6,369	7,595	6,769	6,808	6,687
Pulp, paper and allied products	10,118	11,686	10,613	10,594	9,944
Chemicals	29,669	30,168	26,924	28,413	27,763
Petroleum products	4,934	5,531	4,670	5,128	5,157
Stone, clay and glass products	10,033	10,052	9,442	10,462	9,286
Coke	5,329	5,498	5,909	5,869	5,684
Metals and products	9,375	11,028	9,732	9,746	9,731
Motor vehicles and equipment	21,453	18,716	18,283	21,721	21,026
Waste and scrap materials	9,182	8,850	8,506	9,365	8,950
Forwarder and shipper assn. traffic	8	4	16	18	3
All other carloads	7,108	7,115	6,608	7,292	7,071
Total Cars Loaded	**345,915**	**345,167**	**332,148**	**344,005**	**325,248**
% change from previous year	3.0	7.3	(3.7)	2.0	(1.7)

		% change
Cumulative total: 14 weeks	4,640,148	0.6

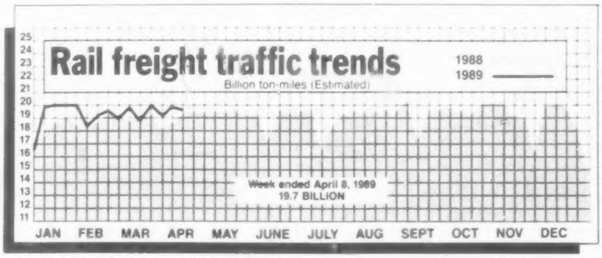
Estimated revenue ton-miles (billions)	19.7	19.9	19.2	20.0	18.9
% change from previous year	3.1	8.7	(3.0)	3.1	(.5)

Total:	**1989**	**1988**	**% change**
14 weeks	168.8	165.8	1.1

Intermodal traffic

	Apr. 8	Apr. 1	Mar. 25	Mar. 18	Mar. 11
Trailers	68,407	66,503	65,924	69,948	68,505
Containers	49,038	46,641	47,984	45,636	43,213
Total	**117,445**	**113,144**	**113,908**	**115,584**	**111,718**
% change from previous year	10.1	1.4	.9	2.4	.1

		% change
Cumulative total: 14 weeks	1,566,680	1.7



Source: Association of American Railroads

Southern Pacific: Has installed Digital Traffic Control, a networked dispatch control system supplied by Digital Concepts, Inc. of Monroeville, Pa., for four dispatchers in its Los Angeles Division office. Each dispatcher workstation contains its own high speed processor and displays information via two high resolution color CRTs. SP plans to install approximately 20 additional workstations later this year.

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June 1989

Railway Age

...for the *new* age of railways and rail transit

Conrail Intermodal: Improving a winning game

The freight car goes higher-tech

Exploring the "train control" market

Urban planners map new commuter lines

June 1989

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The industry's leader in intermodal volume, Conrail is now taking the lead in working with third parties to ensure that door-to-door service is as good as ramp-to-ramp.

37 A Railroader's Guide to Washington

Who's who in the new Administration and the new Congress? You'll find that and more in this updated *Railway Age*/Unit name-rank-and-phone-number directory.

45 The freight car goes higher-tech

To meet the demands of productivity-conscious railroads, carbuilders are coming up with new designs, including articulated cars, multi-purpose cars, and carless technology.

55 ATCS: An evolving science

The rewards of advanced train control and allied systems are great enough to indicate a big market. But there are risks, too, so the developers are proceeding with caution.

64 Commuter railroads: Antidote to an overdose of autos

Concluding a three-part series, Contributing Editor William D. Middleton examines the plans of cities coast to coast that are considering the commuter-rail option to ease road congestion.

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MARKET OUTLOOK

Equipment

Itel Rail: Ordered 150 73-foot center beam flatcars from Thrall Car for July-August delivery, at a cost of more than $7 million. Earlier, Itel had acquired 300 similar cars from Thrall for serving lumber-industry customers. The latest order is intended to expand the Itel Pullman lease fleet and replace older cars on the Southern Railway of British Columbia, acquired last year by Itel.

Facilities

Bay Area Rapid Transit: Has drafted a Five Year Plan and Capital Improvement Program calling for the expenditure of $2.9 billion to fund extensions, parking space expansions, system capacity expansion, and other improvements to the BART rail system.

Canadian National: Awarded a Stage II contract to ALK Associates, Inc., of Princeton for the development of a motive power information and management support system for its motive power control center in Montreal.

Chicago & North Western: Has begun a $70 million, multi-year track improvement program for its east-west main line between Chicago and Fremont, Neb. The 1989 program, budgeted at $18,190,000, will include installation of 27 miles of new 136-pound cwr, insertion of 179,600 crossties and surfacing of about 240 miles of track.

Municipality of Metropolitan Seattle: Awarded a contract to the Washington, D.C., firm of R.L. Banks & Associates to develop a final plan which will enable Seattle Metro to decide whether to establish commuter railroad service linking downtown Seattle with Puyallup, 32 miles to the south. Assisting Banks will be LTK Engineering Services of Philadelphia for locomotive and car design, JHK & Associates of Alexandria, Va., ridership forecasts, and three Seattle firms which will provide local expertise.

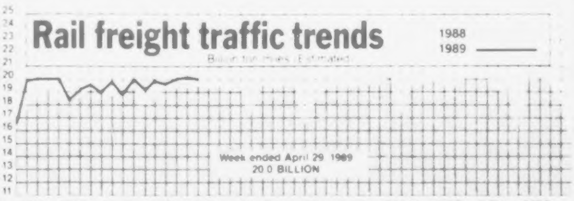
New York Department of Transportation: Awarded a contract to the joint venture design team of Andrews and Clark, Gibbs & Hill, and Vollmer Associates for a grade crossing elimination project in Mineola that will separate six roadway crossings from Long Island Rail Road traffic. Construction will begin in 1991.

Revenue freight carloadings

Commodity	May 6 week	Apr. 29 week	Apr. 22 week	Apr. 15 week
Grain	26,372	27,344	29,659	31,050
Other farm products	1,514	2,188	2,501	2,396
Metallic ores	21,031	22,909	21,385	21,414
Coal	126,563	124,863	128,045	128,629
Crushed stone, gravel and sand	16,660	16,819	16,326	15,388
Nonmetallic minerals	11,030	9,906	9,696	9,897
Grain mill products	10,299	10,343	10,152	10,240
Food and kindred products	8,699	8,995	8,843	8,513
Primary forest products	9,065	9,936	9,435	9,630
Lumber and wood products	6,766	7,279	6,882	6,734
Pulp, paper and allied products	10,195	10,688	10,427	10,224
Chemicals	28,681	30,176	30,272	29,260
Petroleum products	4,981	5,198	5,218	5,002
Stone, clay and glass products	10,515	10,843	11,126	10,518
Coke	5,505	5,192	5,728	6,113
Metals and products	10,104	10,634	9,897	9,956
Motor vehicles and equipment	21,467	22,199	21,872	22,540
Waste and scrap materials	8,989	9,698	9,387	9,489
Forwarder and shipper assn. traffic	17	11	6	5
All other carloads	7,310	7,624	7,344	6,980
Total Cars Loaded	**345,763**	**352,845**	**354,201**	**353,978**
% change from previous year	0	.5	2.0	1.2
			% change	
Cumulative total: 18 weeks		6,042,751	0.6	
Estimated revenue ton-miles (billions)	19.7	20.0	20.1	20.0
% change from previous year	1.0	1.0	2.0	.5
Total:	**1989**	**1988**		**% change**
18 weeks	348.7	344.6		1.2

Intermodal traffic

	May 6	Apr 29	Apr 22	Apr 15
Trailers	66,072	67,259	67,486	66,258
Containers	47,218	47,282	45,822	47,830
Total	113,290	114,541	113,308	114,088
% change from previous year	.6	[illegible]	2.6	3.8
			% change	
Cumulative total: 18 weeks		[illegible]	[illegible]	



Source: Association of American Railroads

Freight cars

	DELIVERED		ORDERED		ON ORDER AND UNDELIVERED	
	1st quarter 1989	1st quarter 1988	1st quarter 1989	1st quarter 1988	Apr. 1 1989	Apr. 1 1988
Built new by carbuilders	7,286	4,457	11,040	7,209	19,707	12,692
Built new in RR shops	0	0	0	35	0	35
Built new—Total	7,286	4,457	11,040	7,244	19,707	12,727
Rebuilt	0	0	0	101	0	281
TOTAL	**7,286**	**4,457**	**11,040**	**7,345**	**19,707**	**13,008**
Locomotives (new and rebuilt)	82	84	NA	NA	148	120

Source: Transportation Div., AAR and American Railway Car Institute

slack action. But coal and grain don't complain much about ride quality, and so the justification for articulation of bulk-commodity cars will have more to do with reductions in wear-and-tear on equipment and in possible savings in materials and car components.

• Improvements not just cosmetic. If there is one car-type where change has been less visible to the naked eye, it's probably the tank car—with the exception of the 800-car GATX TankTrain fleet. As one car-builder puts it, the basics of the containment vessel, the tank, haven't changed all that much in 20 years or so. Changes that have taken place have largely been in the area of improving safety.

But the tank-car manufacturers are seeing changes imposed by customers—especially in the petroleum, chemical and food industries—in connection with quality-improvement programs that many of them have adopted.

Some changes would probably be regarded as cosmetic. Some customers, one builder notes, are paying a lot more attention to exterior painting schemes—not just as protection for the car but in terms of projecting a quality image as their car goes rolling around the country.

But the improvements the major tank car builders, Union Tank and Trinity, have made recently are a lot more than skin-deep. Improved materials are going into the cars. On cars built by Union Tank to carry high-fructose corn syrup, for example, capacity has been increased and quality improved, not just in the interior coating but importantly in the use of stainless steel valving and other stainless steel appurtenances. Somewhat exotic grades of stainless are also showing up in cars being produced to handle specialty chemicals.

And at this point Union Tank tends to look at its so-called "sandwich" car in effect, a Thermos bottle on wheels, as its most dynamic car—one that can be custom-tailored to meet individual customer requirements.

The best design has to be executed in the shop, however, and that's why Union Tank has been investing in computer-operated lathing machines, and in greater use of shop robotics in order to produce a more consistent product.

Approaching the midpoint of 1989, car-builders without exception are looking at order books that have very few if any blank spots. And, while there have been fears that the surge in carbuilding activity would be held back by shortages in key components, such has not been the case.

The main concerns have had to do with castings and axles, as well as with basic steel. But, as Gunderson puts it, steel supplies have eased up, and any problems with castings and axles should be taken care of with the re-opening of ASF's plant in Illinois and the re-opening of the ex-Bethlehem Steel axle plant in Pennsylvania.

• What HPIT accomplished. Inevitably, in any consideration of higher-tech in the freight-car industry, attention turns to the recent High Performance Integral Train project of the AAR, and what it did or did not accomplish. And an individual who was close to HPIT from start to finish makes a few observations.

In the over-all, the program greatly improved the ability to look at and analyze both technological and economic considerations at the rail industry level.

The analytical techniques used in HPIT evaluations were a big help in developing specifications for testing new and untried car designs, specifications aimed at making testing less costly and at getting successful designs into service more quickly.

HPIT heightened industry awareness, among railroads and manufacturers, of the potential in design improvement. Its specifics were to be cited and near-term results measured. HPIT's accomplishments might be said to be concentrated in the further development of carless technology, in work with the vertical isolation pad, and in testing of equipment with slackless drawbars.

Considering the effort that went into the program, some observers might look back critically and regard HPIT as much ado about not very much. That's hardly fair, and besides it's not accurate. Progress was made, and new technologies are being introduced, as a direct or indirect result of the attention sharply focused on new tech. And besides, in all things, safety and operating considerations have to be taken fully into account, and "some things just simply shouldn't happen overnight."

And maybe it's not quite time to gift-wrap the last sledgehammer and send it off to the Smithsonian. But take it as guaranteed that the upward curve in freight-car design and capability will continue. Customers are pushing railroads, railroads seem to be more actively pushing manufacturers, and manufacturers are not only responding quickly but acting with a high degree of initiative.

What it all adds up to is an impressive real and potential contribution of technology to railroad market share and profitability.

ECAP's car forecast:

What are the prospects, near-term, for freight-car manufacturers? In a word, the prospects are "constructive."

That's the conclusion reached by Economic Consulting & Planning, Inc., after an analysis of available rail-industry data coupled with ECAP's own extensive assessment of economic trends which are likely to affect rail traffic in the 1989-90 period.

Last year, deliveries of new freight cars added up to about 22,500 units. ECAP is forecasting deliveries of 29,500 cars this year and 34,500 cars in 1990.

Both future-delivery numbers are substantially higher than the estimates developed from the most recent member-survey by the American Railway Car Institute. After the averaging-out of responses, ARCI is looking at deliveries of 23,345 cars in 1989 and 27,590 cars in 1990. The ARCI forecast stretches through 1991 and for '91 the predicted total on deliveries, about 31,000, is lower than the total developed by ECAP for 1990.

ECAP's outlook analyses take a number of factors into account, including the state of the economy and its impact on traffic, the age and condition of the car fleet, and the effects of recent and continuing gains in equipment utilization. Among the conclusions reached by ECAP's Norma Pace, Peter M. Toja and Kenneth J. Kremar:

—Modest economic growth is in the offing for this year, to be followed not by a recession but by what ECAP calls "a soft landing" in 1990. This translates into a 1989 over-all increase of 1.5% in commodity carloadings, with coal and chemical traffic up by 4% and intermodal gaining by 3%. For next year, ECAP sees total loadings dropping by 1%, with intermodal loadings down by 2.5% "as industrial sector activity falters and imports weaken."

—The age of the fleet, ECAP believes, suggests the presence of "a modest replacement cycle" that will continue even if the economy does soften in 1990. Even though 22,500 new cars were added last year while 71,000 older cars were retired, the average age of the fleet is close to 16.5 years, and almost half of the total fleet, railroad and private, has been in service for more than 15 years.

—Utilization has gone up. For the 1985-88 period, equipment loadings climb-

Even with modest traffic growth, the fleet must expand

Freight Car Forecast Summary—1986 to 1990

(000 units)

Year	Box-cars	Covered Hoppers	Flat-cars	Gondolas	Open Hoppers	Tank Cars	Other	Total
1986	0.1	2.1	4.8	0.4	1.0	3.6	0.0	12.0
1987	0.1	3.0	4.7	0.1	0.4	5.1	0.0	13.2
1988	0.3	7.3	6.7	1.3	0.6	6.3	0.0	22.5
1989	0.5	8.0	7.0	3.0	4.0	7.0	0.0	29.5
1990	0.5	8.5	7.0	5.0	6.0	7.5	0.0	34.5

Forecasts begin in 1989
Source: American Railway Car Institute
Economic Consulting & Planning, Inc.

ed 12% but the average number of car trips per year increased by 24%. This suggests, ECAP says, that "a significant portion of the cars in the fleet are 'older' than their calendar age, and approaching the end of their 'useful' life."

—The number of cars listed as "surplus" remains at about 50,000 units. But, like a number of other analysts, ECAP questions whether that's a "real" surplus, since "we are of the opinion that the bulk of these cars are in less than prime operating condition."

ECAP's view of economic activity is that 1989 will come in at a 3.4% increase in real GNP, with some tailing-off toward year-end. That would follow a 3.9% advance in real GNP last year. The industrial sector continues to look reasonably strong, with a forecast increase of 4% in manufacturing activity, down slightly from 6% in 1988. Housing starts are expected to continue to slide, but by 3% this year instead of the 10% declines recorded in each of the past two years.

For next year, ECAP sees weakness in both business and consumer spending, and "a further maturing of the export expansion." Moderate growth is expected to continue in key overseas economies, but "the ability of U.S. companies to further penetrate foreign markets will be limited." Real economic growth, ECAP believes, will rise by only 1.6% for the year as a whole.

In analyzing the rail industry specifically, ECAP's researchers ran into an immediate problem with AAR data. Commodity carloadings were reported as 22,140,000, up by 4.8% from 1988. But equipment loadings were reported as 20,825,000 down by 1.7% from '88. That wide disparity, ECAP says, appears to have resulted from reporting problems at one major railroad, CSXT, and so in trying to analyze loadings by car type, ECAP excluded CSXT and cross-referenced the results with 1988 key commodity loadings that would apply to specific car types.

Then, in trying to look ahead at commodity loadings, factoring in the broad economic projections, ECAP came up with its forecast of a 1.5% increase in commodity loadings this year, followed by a 1.2% decline in 1990.

For 1989, the analysts see gains in nine of 18 commodity categories but with no category topping 5% except motor vehicles, up by 5.1%. For 1990, ECAP sees increases for only six commodity groups, coal, petroleum products and four groups related to the agricultural sector. No category shows a projected gain of more than 2%.

All of these analyses lead to ECAP's forecasts of carbuilding by car type.

—Boxcar traffic is expected to continue to decline. Thanks to over-buying a decade or so ago, today's fleet is relatively young, and the surplus remains at about 6% of the fleet. ECAP does not see 1989-90 orders deliveries of more than about 500 cars, most of them equipped cars for handling such commodities as auto parts and paper products.

—By contrast, ECAP sees signals that "replacement pressure is mounting, and some fleet expansion is in the offing" for covered hopper cars. The chemicals and plastics industries have major expansion plans, researchers note, and if the agricultural sector returns to more normal growing conditions, these factors should lead to an increase in new-equipment demand. In addition, 25% of the covered hopper fleet has been in service for 20 or more years, utilization has increased by about 28% in the 1986-88 period (thus "aging" the fleet still further), and the surplus represents just 2% of the fleet. The principal demand, ECAP believes, will be for cars of 4,000-cubic foot capacity and up. Total new-car installations are forecast at 8,000 cars this year and 8,500 cars in 1990.

—Many of the same factors apply to flatcars, in large part because of the age utilization factors but also because ECAP sees flatcar traffic increasing in 1989 and remaining above 1988 levels next year despite weakness in some commodities and markets. The projection is for deliveries of 7,000 cars this year and next, with more than 75% represented by intermodal units.

—For gondolas, ECAP sees at least a modest replacement market developing, along with a modest absolute increase in the GT-type fleet of coal cars. This translates to a forecast of 3,000 units installed in 1989 and 5,000 in 1990.

—Deliveries of open-top hopper cars may be somewhat higher, 4,000 cars this year and 6,000 in 1990. ECAP is forecasting a 4% increase in coal traffic this year, and an over-all increase of 2% in open-top loadings. Loadings for 1989-90 are expected to average about 9% above the annual average for the 1984-88 period and this forecast, coupled with actual fleet age and increased wear-and-tear from improved utilization, should support the car-demand forecast.

—During the carbuilding recession, tank cars accounted for a large part of what activity there was, and ECAP sees the market remaining relatively strong. Comparing 1989-90 with 1984-88, ECAP sees tank car loadings running about 14% higher on an average annual basis. This, combined with expansion in the chemicals industry and a look at what has happened to fleet-age despite recent additions, leads ECAP to a forecast of 7,000 tank-car installations this year and 7,500 in 1990.

Compared with carbuilding levels of a decade ago, the most optimistic forecasts of today seem modest, and ARCI's are less optimistic than ECAP's.

But for railcar manufacturers and for rail shippers, the trends are pointing in the right direction. ■

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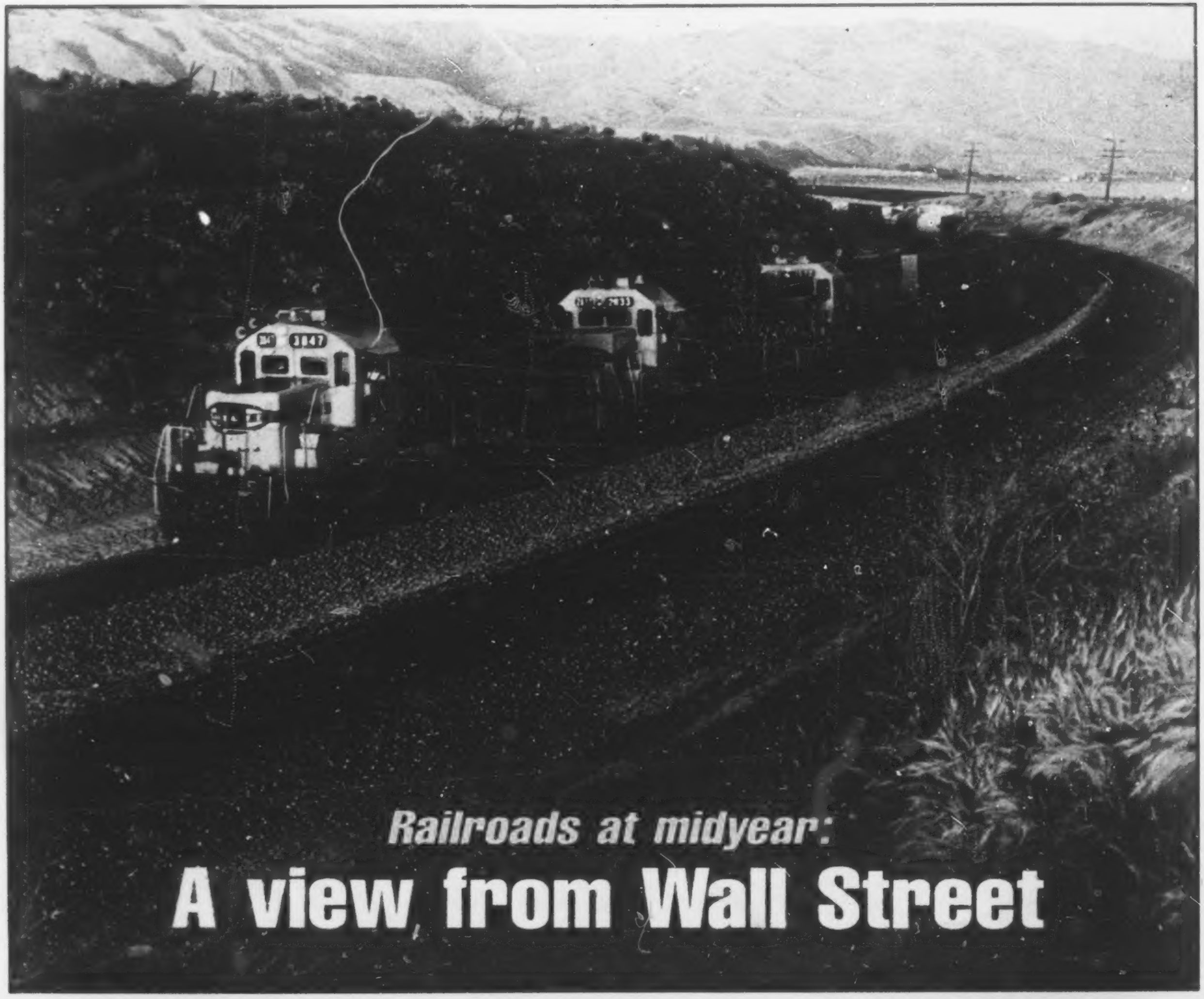
July 1989

Railway Age

...for the new age of railways and rail transit



Railroads at midyear:

A view from Wall Street

BN's Technical Training Center:

"The best" gets better

Car & Locomotive Repair Directory

TTC seeks to expand as more riders climb aboard

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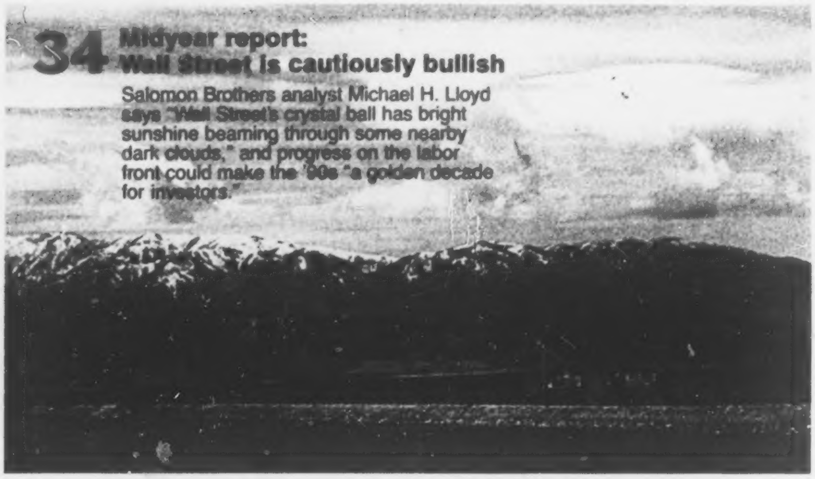

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INSIDE

Railroads at midyear, and beyond

LUTHER S. MILLER

"Cautious optimism" is a term we're all familiar with. It means that right now things look pretty good, but if they turn out differently—well, don't say we didn't warn you.

Still, it's a useful term and we have chosen a variation of it—"cautiously bullish"—to describe the midyear report on railroads which Michael H. Lloyd of Salomon Brothers prepared for this issue (p. 34).

Wall Street's view of the industry matters mightily to the railroads, which is why some of them spend a considerable amount of time and money meeting with analysts and trundling them up and down the line on inspection trains. It was with this in mind that we asked Mr. Lloyd, one of the most respected transportation analysts in the business, to provide a "Wall Street view" for our midyear examination of the state-of-the-industry. The result is a thoughtful, balanced report that examines the pluses and the minuses. The bottom line: "Wall Street's crystal ball for railroads has bright sunshine beaming through some nearby dark clouds."

One of those "dark clouds" is the Interstate Commerce Commission's recent decision to modify the Railroad Cost Adjustment formula (on which cost-based rate increases are figured) by requiring railroads to pass all productivity savings through to their customers. Mr. Lloyd is not alone in his concern over the possible consequences of this. Standard & Poor's says it "will force a reevaluation of investment programs," with long-term-payback projects jeopardized (p. 9).

Another cloud is that produced by soaring railroad debt resulting from restructurings. Railroad managements, says Mr. Lloyd, are going to have to "balance Wall Street preference for the short-term stock price benefit from restructuring against the limits of prudent leverage."

This subject is dealt with at greater length in Watching Washington (p. 17), which reports on a widely-circulated paper, by analyst Isabel H. Benham, that examines the wisdom of the "high level of debt exposure" that characterizes some balance sheets. "If rail equities continue to run a collision course with rail debt, the future viability of the industry may be seriously weakened," says Ms. Benham.

Congress is also getting worried. In mid-June Senator Ernest V. Hollings (D.-S.C.) announced that the Surface Transportation Subcommittee had scheduled a hearing on legislation (S.1005) providing the ICC with jurisdiction over the acquisition of control of a Class I railroad by a non-carrier. He said the subcommittee would also examine "other acquisition, debt and leveraging questions which may affect the long-term financial health of the industry and individual carriers."

One question that dwarfs all others with respect to the short- and long-term prospects of railroads has to do with efforts to reduce high labor costs.

That is the biggest question on the minds of investors, says Mr. Lloyd. He believes that "if railroad managements can find a common denominator to satisfy their unions' needs while improving the competitive stance of railroads, the 1990s could become a golden decade for railroad investors."

The search for that common denominator is the subject of Senior Editor Gus Welty's Lines on Labor column (p. 18).

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...for the new age of railways and rail transit

Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200
Fax: 212-633-1165

ARTHUR J. McGINNIS, Jr.,
President and Publisher
LUTHER S. MILLER, Editor

Publishing Director: Robert G. Lewis

Managing Editor: Judy McCusker
Engineering Editor: Art Slepian
Contributing Editors: John H. Armstrong,
William D. Middleton
Art Director: Maurice H. Mates
Graphics Director: Diana Line
Graphics Coordinator: Pat Nash
Photo Editor: Kent Patterson

Production Manager: Tina Small
Circulation Director: John Scunziano
Circulation Fulfillment Manager: Sheila Sullivan

Western Editorial Offices
Chicago, Ill. 60604,
175 W. Jackson Boulevard, Suite A-1927
312/427-2729
Fax: 312-427-3014

GUS WELTY, Senior Editor
Intermodal Editor: Bill Fahrenwald
Editorial Assistant: Wanda Welty
Contributing Editor: F. K. Plous

International Offices
Falmouth, Cornwall, TR11 4RJ, England
P.O. Box 8
Telephone: 44-326-313945
Fax: 011-44-326-319066

International Editors: Michael Knutton,
David Briginshaw

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MARKET OUTLOOK

Equipment

Amtrak: Ordered 70 material handling headend cars from Thrall at a cost of $317,000 each. Amtrak will also modify six former VIA Rail mail cars at a total cost of $1 million.

Itel Rail: Ordered 400 100-ton, 5,850-cubic-foot-capacity covered hopper cars for transportation and storage of plastic pellets from Trinity Industries at a cost of more than $22 million. Deliveries began in May and will be completed next January.

NJ Transit: An UMTA commitment to supply $211 million to NJ Transit over a three-year period, subject to annual appropriations by Congress, is designed to permit the agency to sell Grant Anticipation Notes to finance projects before the grants are actually received. Along with $90 million previously committed, the money reportedly will go toward the overhaul of 230 Arrow III cars ($178.5 million); purchase of six locomotives ($26.4 million); 50 new cars ($47 million); track improvements ($36.5 million); and signal improvements ($12.5 million).

Santa Fe: Ordered 100 five-platform double-stack cars from Gunderson at a cost of $19 million. Gunderson calls the cars "Maxi-Stack 2½" units (a variation of the Maxi-Stack III), with 48-foot wells and 125-ton trucks.

Washington Metropolitan Area Transit Authority: Will acquire 63 new rapid transit cars from Breda at a cost of $83 million, and plans to buy an additional 32 cars when funds become available. WMATA's current fleet consists of 366 Breda cars and 298 built by Rohr.

Wisconsin Central: Placed an $11-million order with Bethlehem Steel for 250 3,000-cubic-foot-capacity covered hopper cars for hauling roofing granules. Deliveries will begin in October.

Facilities

CSX Transportation: A new $5.6-million, 28,000-square-foot shop in Cumberland, Md., will be capable of performing running repairs on more than 65 cars a day.

St. Louis Bi-State Development Agency: Awarded a contract to LS Transit Systems, Inc., for final track design of the 18-mile Metro-Link light rail system.

Toronto Transit Commission: Will construct a one-mile extension to its Spadina line at a cost of $159 million (Canadian). Station and alignment designs are under study and ground-breaking will take place by the spring of 1991.

Union Pacific: Will build a $2.2-million automobile unloading facility at West Memphis, Ark., for use by Toyota Motor Sales. The terminal, scheduled for November completion, will cover 13.2 acres, all paved, and will include two 1,600-foot tracks, two buildings, and security lighting and fencing.

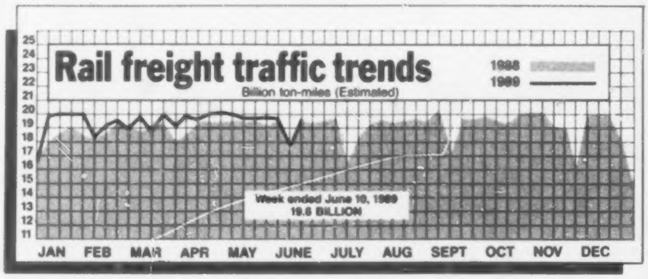
Revenue freight carloadings

Commodity	June 10 week	June 3 week	May 27 week	May 20 week	May 13 week
Grain	27,196	24,207	26,518	27,505	25,107
Other farm products	2,064	1,935	1,561	1,586	1,510
Metallic ores	21,710	23,903	23,347	23,177	21,282
Coal	130,440	118,888	124,635	126,737	127,200
Crushed stone, gravel and sand	17,014	14,842	16,697	16,405	17,054
Nonmetallic minerals	10,576	9,120	11,867	11,029	10,521
Grain mill products	10,126	8,479	10,038	10,046	10,104
Food and kindred products	8,684	7,806	8,764	8,817	8,868
Primary forest products	9,420	8,271	9,645	9,475	9,058
Lumber and wood products	6,688	6,133	7,171	6,871	6,603
Pulp, paper and allied products	10,056	10,826	10,358	10,382	10,152
Chemicals	25,788	23,839	26,857	27,244	28,273
Petroleum products	5,084	4,720	5,508	5,137	4,925
Stone, clay and glass products	10,744	9,649	11,013	10,625	10,657
Coke	5,278	5,535	5,377	5,485	5,577
Metals and products	9,322	9,271	9,941	10,383	9,702
Motor vehicles and equipment	20,167	16,709	20,484	21,091	21,192
Waste and scrap materials	8,637	7,542	9,449	9,403	9,525
All other carloads	6,570	6,318	7,988	7,236	7,250
Total Cars Loaded	**345,764**	**317,982**	**347,013**	**348,069**	**344,574**
% change from previous year	(.5)	3.8	(.4)	1.9	(.8)
			% change		
Cumulative total: 23 weeks		7,746,639	0.6		
Estimated revenue ton-miles (billions)	19.6	17.9	19.7	19.8	19.7
% change from previous year	.5	3.5	.0	2.6	.5
Total:		1989	1988		% change
23 weeks		445.3	439.9		1.2

Intermodal traffic

	June 10	June 3	May 27	May 20	May 13
Trailers	65,120	57,593	63,212	64,975	65,900
Containers	45,628	40,447	45,155	46,459	46,741
Total	**110,748**	**98,040**	**108,367**	**111,434**	**112,641**
% change from previous year	(.6)	(4.1)	(6.3)	(.1)	.4

		% change
Cumulative total: 23 weeks	2,566,152	1.0



Source: Association of American Railroads

Union Pacific: Awarded a contract to CXT for 55,000 concrete ties to be installed in 1989. This is CXT's third such contract from UP, for a total of 130,000 ties for installation on main lines in Oregon, Nevada, and Nebraska.

Wisconsin Central: Opened a new intermodal facility adjacent to its classification yard at Neenah, Wis., to facilitate next-morning delivery of trailers and containers to Chicago from cities in the Fox River area, including Appleton, Menasha, Kaukauna, Kimberly, and Oshkosh.

By MICHAEL H. LLOYD, CFA
Salomon Brothers
for *Railway Age*

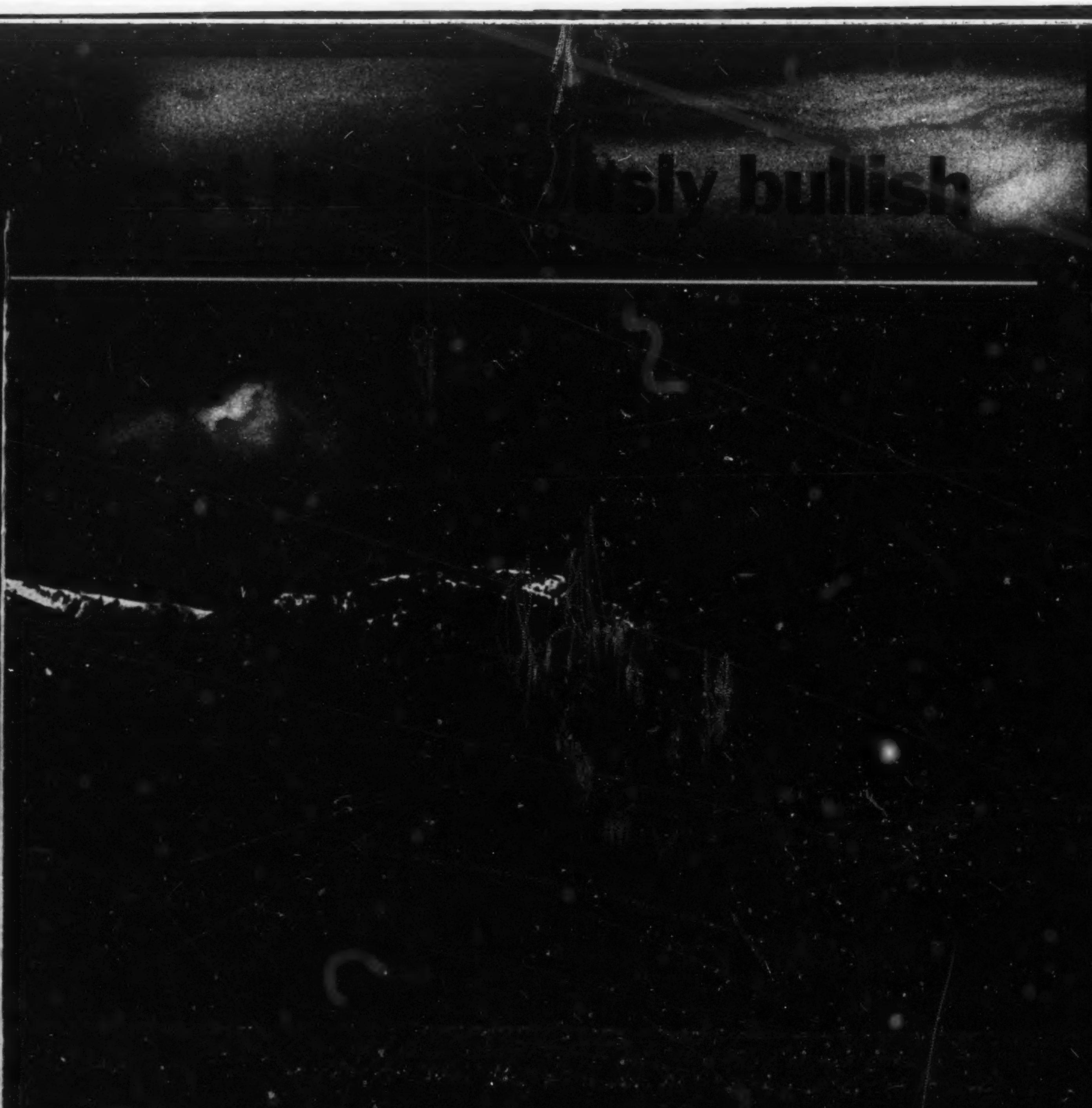
Thus far in 1989, there have been no major changes in railroad traffic trends, although automotive traffic and coal shipments (especially exports) have been stronger than expected.

During the first 23 weeks of this year, revenue ton-miles expanded by 1.2% for Class I railroads as originated carloads contracted 0.6%. Industry originations of coal carloads increased by 5.4% and motor vehicles and equipment jumped by 5.8%. Chemicals also posted a strong advance of 5.5%. Elsewhere, however, declines dominated, with grain originations down by 10.0% (reflecting an anticipated drop in exports), and a weakening economy led to decreases in almost every other category.

During the remaining months of 1989, we expect economic activity to be much slower than during the first quarter with the slow pace continuing into next year. Furthermore, automotive carloads are likely to register year-to-year declines during the next several quarters.

The two traffic segments which have above-average growth prospects are coal and grain. Coal exports are being helped by the lessening of foreign competition as Australia has been shutting down unprofitable mines and Europe has discovered that there are more cost-efficient ways to provide jobs than with huge subsidies for coal production. Meanwhile, grain traffic comparisons will become much easier in a few months relative to the drought-stricken second half of last year. Thus, if this year's crops of spring wheat and corn are normal, we expect a surge in near-term demand for grain cars on U.S. railroads. Furthermore, foreign demand for our high-quality metallurgical coal and ample supplies of grain may continue to bolster shipment levels for these important commodities through 1990. Of course, if the U.S. dollar continues to strengthen versus other currencies, the attractiveness of our coal and grain

[illegible]sly bullish



to foreign buyers would eventually be undermined, if it hasn't been already.

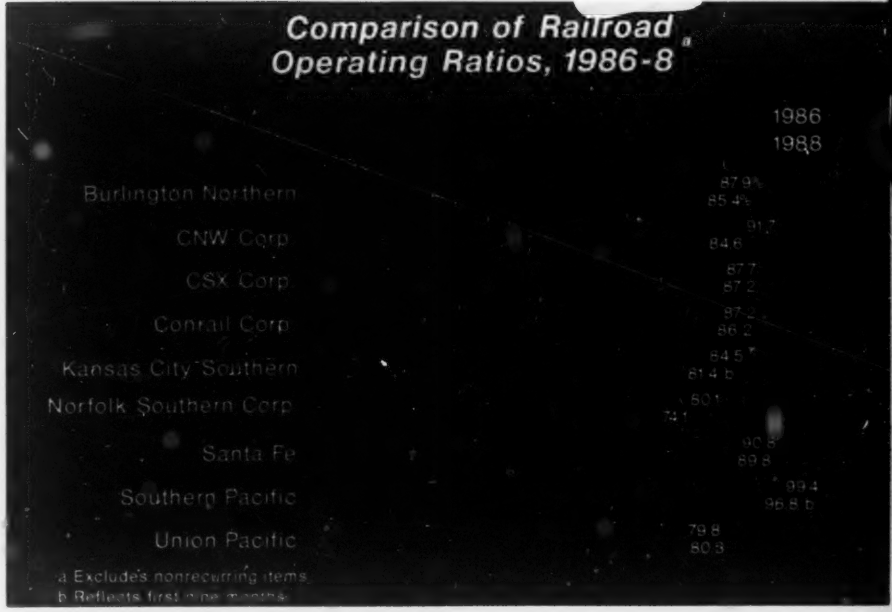
- **Earnings and stock prices.** Led by consecutive years of record revenue ton-miles for railroads in 1987 and 1988, as well as a robust rate environment last year, railroad profits have been growing strongly. And the earnings momentum has been reflected in higher stock prices over the past two years.

During 1987 and 1988 railroad stock prices outperformed the general stock market as the S&P Rail index advanced by 8.[illegible]% and 16.7%, respectively, compared with gains of 2.0% and 12.4% for the S&P 500 index. This year has been more erratic with strong relative performance of railroad stock prices during January followed by two months of disappointing performance. Investors became increasingly concerned about the effect of a slowing economy on traffic and the ICC's mortal blow to quarterly rate increases with its Ex Parte 290 (Sub No. 14) decision to force the pass-through of all productivity gains to shippers. Consequently, rail stocks rose by only 4.2% during the first quarter of 1989 compared with a 6.1% gain for the S&P 500. In April, the S&P rail index rallied somewhat, rising by [illegible].0% while the S&P 500 rose by 5.0% as railroad stock prices were helped by a developing consensus that we were not entering a recession but were headed for a soft landing instead. Furthermore, continued large purchases of U.S. grain by the Soviet Union led to growing optimism about strong grain exports during the second half of 1989. More important, the stock price of CNW was boosted by a takeover bid. Then, in May, Union Pacific's stock price was helped by a major stock buyback program and the S&P Rail index advanced by 3.4%, nearly matching the S&P 500's 3.5% gain. Overall, the railroad stock index rose by 15.8% during the first five months of this year, which was moderately above the 15.4% advance of the S&P 500.

We expect railroad stock prices to underperform the S&P 500 in future quarters and for the full year of 1989 because of weakened fundamentals. As mentioned earlier year-to-year comparisons will be adversely affected by the slowing economy with industrial activity noticeably slower than during the first quarter. In particular, highly profitable shipments of automobiles and automotive parts will show negative comparisons during the second half of this year, as high inventories cause production cutbacks. Meanwhile, in the wake of the recent ICC decision on productivity pass throughs, the rate environment is not favorable and revenue per ton-mile could once again deteriorate as the year progresses. All of this adds up to an earnings scenario that could contain some unpleasant surprises, with concomitant negative effects on railroad stock prices. Consequently, Salomon Brothers Inc. currently maintains a negative stance toward railroad stock prices in general, but we continue to recommend two restructuring situations: Norfolk Southern ($36) and Union Pacific ($73). Norfolk Southern is expected to use its strong balance sheet to significantly expand the current repurchase program for its common stock. At Union Pacific, we believe the recent restructuring steps (which include the proposed sale of real estate assets and a 10% share buyback) are harbingers of future positive actions to benefit shareholders. It should also be noted that the company's top 20-25 executives have a unique incentive to help boost their stock price. If the price reaches $100 for 60 consecutive days, these individuals split $17 million. And the pot of gold gets larger at higher stock prices.

Beyond 1989, the stock price outlook for railroads could improve significantly depending on the outcome of current labor negotiations. Hopefully, railroad union leaders and members will recognize that the work rules of 70 years ago have to change, unless they want to doom the railroad industry to further loss of market share. Revenue ton-mile growth of 1.5% annually during the past ten years was half the pace of industrial production, and without a more competitive cost structure future rail traffic gains could also be disappointing. Hence, investors will be focusing on railroads' ability to reduce their expense structure, where labor costs dominate.

From an operating efficiency viewpoint, Wall Street has been impressed by the substantial improvement which several railroads have achieved during the past two years. While strong traffic and higher rates undoubtedly helped, the benefits of headcount reductions and the sale of short line segments have earned the investment community's admiration, especially at Norfolk Southern. Even though short line sales are now in limbo, railroads can hopefully achieve further operating ratio reductions during the early 1990s that at least match the general gains registered during the 1986-88 period.


Comparison of Railroad Operating Ratios, 1986-8[a]

a Excludes nonrecurring items.
b Reflects first nine months.

If railroad managements can find a common denominator to satisfy their unions' needs while improving the competitive stance of railroads, the 1990s could become a golden decade for railroad investors.

- **Congress and the ICC.** The congressional and regulatory environment for railroads appears to be stabilizing, albeit with a bigger tilt toward shippers from the ICC viewpoint. We do not expect a repeat of the close call last Fall on Senate consideration of a pro-shipper bill to alter some provisions of the Staggers Rail Act of 1980. Congress seems to be taking a wait-and-see attitude on future railroad reregulation efforts until the Administration completes its nominations for the ICC, including a new person to replace Heather Gradison. If the new addition to the ICC can avoid the label of being a laissez-faire pro-railroad advocate, Congress is unlikely to resurrect any damaging legislation (which would probably incur a presidential veto in any case). The ICC, however, may be in the midst of a shift toward new interpretations of the Staggers Act, as occurred recently regarding the pass through of all productivity savings to shippers when calculating the railroad cost adjustment factor (RCAF). The recent decision reversed a 1981 decision by the ICC on RCAF productivity, and there appears to be a shifting coalition which will bear watching. In particular, there is an outside chance that J.J. Simmons could assume the chairmanship, which could prove especially troublesome in view of some of his past decisions. Unlike the past two years, railroads now will have to keep a wary eye on the ICC but can relax their vigilance in the halls of Congress (at least for the time being).

- **What Wall Street wants to see.** The experienced investors on Wall Street have

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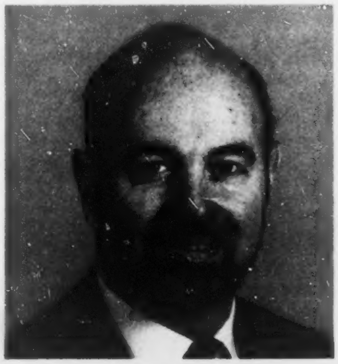

MICHAEL H. LLOYD is a vice president of Salomon Brothers Inc. and is the firm's surface transportation analyst (railroads, shipping and trucking). He is a Chartered Financial Analyst of the Financial Analysts Federation (FAF) and is chairman of the FAF's railroad subcommittee on corporate communications. A native New Yorker, he received a B.S. degree from the United States Air Force Academy in 1963 and an M.B.A. degree from the Harvard Business School in 1972.

been justifiably impressed with the substantial improvement in the track structure of U.S. railroads during the past decade. How pleasantly rare it is today to see any mention of undermaintained roadbed or deferred maintenance. In addition, railroad managements are demonstrating a better awareness of how to better satisfy shareholders' interests. What more could Wall Street ask for?

One area of concern is the aging fleet. The average age of freight cars at even the premier Norfolk Southern Corp. has increased 14% during the past five years and now approaches 19 years. Similar aging has occurred at most other railroads and the financial community will be looking for corrective action, which is already being signaled by escalating budgets for equipment purchases.

Another point of discussion involves enthusiasm for more share buyback programs, but this could become a bed of quicksand if a recession strikes sooner rather than later. In 1988, interest expense absorbed 38% of the combined operating profit of the seven largest U.S. railroad holding companies—well above the 30% level of only two years earlier. Obviously, the recent restructurings at Burlington Northern, CSX, and Santa Fe Pacific have decreased their financial flexibility and the pending LBO of CNW would exacerbate the situation. Hence, railroad managements will have to balance Wall Street preferences for the short-term stock price benefit from restructurings against the limits of prudent leverage. Elsewhere, the financial community will continue to seek frank answers to its sometimes rude questions and will continue to applaud the refreshing candidness which typifies today's railroad executives. And, of course, railroad trips will continue to get plaudits from the kids inside the adults on Wall Street.

Overall, Wall Street is looking for reasons to be bullish on the U.S. railroad industry, which could seize some impressive cost reduction opportunities as the next century approaches. The cost benefits of double-stack container trains and improved railroad service levels could also facilitate the recapture of some traffic from the highways. In addition, there could be a new round of railroad mergers, depending on what happens with Santa Fe's railroad, which now has a new chief executive officer.

In summary, Wall Street's crystal ball for railroads has bright sunshine beaming through some nearby dark clouds. Whatever the outcome, there are exciting times ahead! ■

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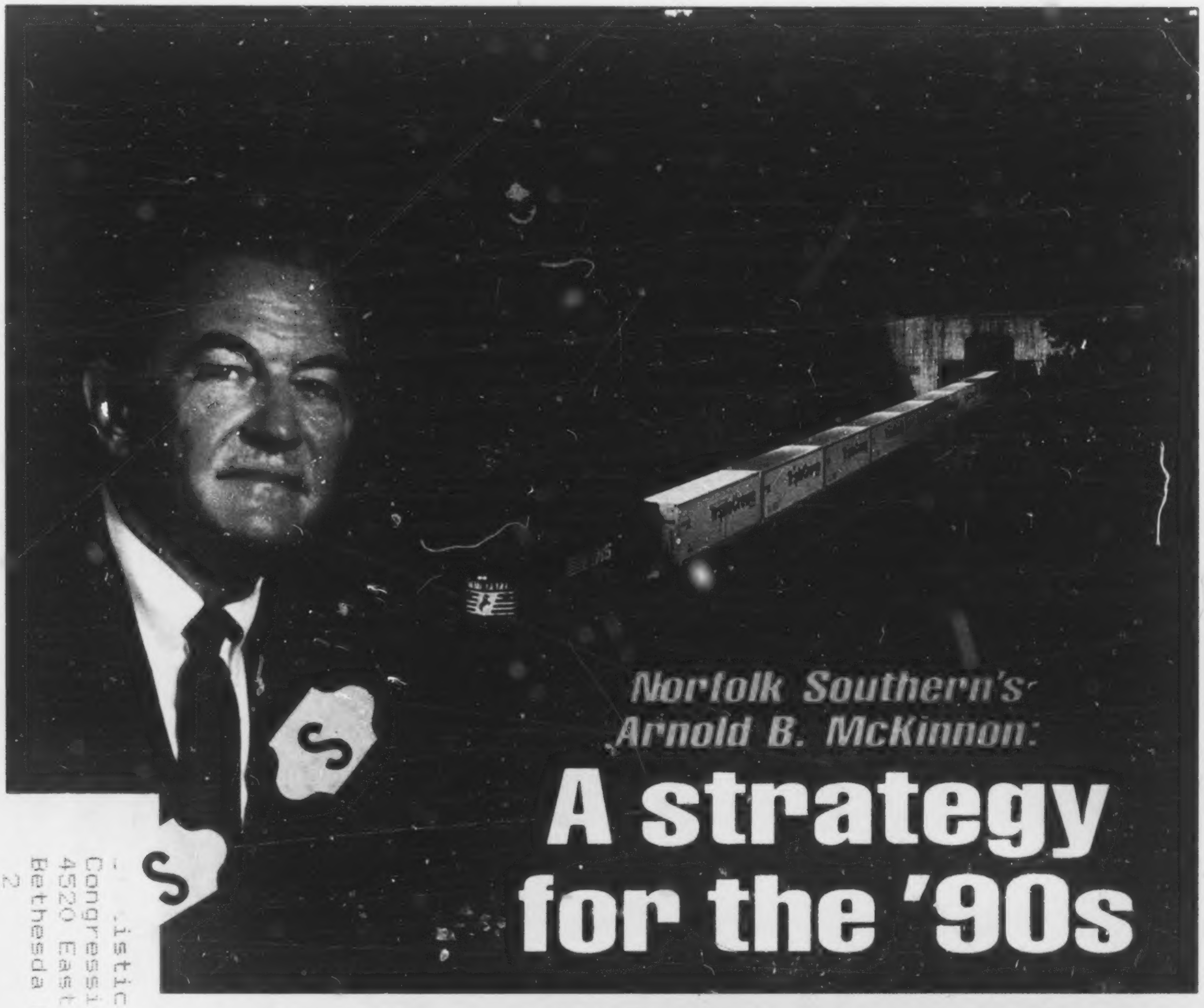

Norfolk Southern's Arnold B. McKinnon:

A strategy for the '90s

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The story behind the switch to a.c.

Railway Age

...for the new age of railways and rail transit

August 1989

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INSIDE

Norfolk Southern: Tracking a winner

LUTHER S. MILLER

For most railroads, the decade of the '80s has been a time of renaissance and recovery. Consistently among the best performers, and often at the top of the list in operating efficiency and profits, has been the Norfolk Southern. How did NS get to the pinnacle, and how does NS propose to stay there? What are some of the challenges the railroad industry must come to grips with in the coming decade? We recently put these questions to Norfolk Southern's chairman, president, and CEO, Arnold B. McKinnon, in a wide-ranging interview conducted in NS's new headquarters building in Norfolk, Va. Much of what Mr. McKinnon told us added up to "A strategy for the '90s," and that's the title under which the transcript of our exchange appears, beginning on p. 33.

Track maintenance is a major theme of this issue, which will have additional distribution at the meetings in Toronto later this month of the American Bridge & Building Association and the Roadmasters and Maintenance of Way Association of America, with concurrent exhibits staged by the Railway Engineering-Maintenance Suppliers Association (REMSA). We surveyed major railroad systems in the U.S. and Canada for Senior Editor Gus Welty's report, "M/w equipment: What chief engineers want" (p. 43). What the equipment suppliers are offering is the subject of the story that follows (p. 47).

Norfolk Southern's CEO himself had some trenchant comments on the art and science of track maintenance, and not surprisingly: NS's Southern Railway virtually invented the modern-day track machine, which revolutionized maintenance practices and drastically reduced m/w manpower needs.

Mr. McKinnon observed that his railroad this year will spend about 34% of a nearly $700 million capital budget on track replacement, and another 18% on "non-discretionary safety and environmental projects" which often come under the T&S department. He expects this level of investment to continue for the foreseeable future, whatever blips appear on the traffic charts.

"We try to maintain our core system to a steady level which will let us provide superior service and safe operation," he told us. "Peak-and-valley maintenance is expensive. You get more bang for your buck if you maintain a steady level of roadway maintenance."

While NS is generous with its track dollars, it also demands more productivity from them.

One way of achieving this, said Mr. McKinnon, "is to develop better methods of using system gangs with mechanized equipment. We've gone from 22 T&S gangs in 1982 to 13 in 1989, and we're working the same number of track miles. Another way is adding to the equipment—a piece here, a piece there." Right now, he said, NS is looking for an economical field weld that's just as good as a plant weld.

For railroads that want to add a piece here, a piece there, the REMSA show in Toronto Aug. 27-30 will be a good place to start. There'll be a great array of machines on view—including some capable of producing quality field welds, economically.

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Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200
Fax: 212-633-1165

ARTHUR J. McGINNIS, Jr.,
President and Publisher
LUTHER S. MILLER, Editor

Publishing Director: Robert G. Lewis

Managing Editor: Judy McCusker
Engineering Editor: Robert E. Tuzik
Contributing Editors: John H. Armstrong,
William D. Middleton
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Photo Editor: Kent Patterson

Production Manager: Tina Small
Circulation Director: John Scunziano
Circulation Fulfillment Manager: Sheila Sullivan

Western Editorial Offices
Chicago, Ill. 60604,
175 W. Jackson Boulevard, Suite A-1927
312/427-2729
Fax: 312-427-3014

GUS WELTY, Senior Editor
Editorial Assistant: Wanda Welty
Contributing Editor: F. K. Plous

International Offices
Falmouth, Cornwall, TR11 4RJ, England
P.O. Box 8
Telephone: 44-326-313945
Fax: 011-44-326-319066

International Editors: Michael Knutton,
David Briginshaw

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MARKET OUTLOOK

Equipment

Miner Railcar Services: Is offering for sale 55 reconditioned, 70-ton, four-outlet ballast cars with 2,000 cubic foot capacity and a light weight of 50,000 pounds.

New Jersey Transit: Ordered 50 new commuter cars from Bombardier at a cost of approximately $41.5 million, with options for 75 additional coaches that would bring the total value of the order to around $100 million. Delivery is to begin 12½ months after signing of the contract, which was announced July 25; an incentive clause would boost payments by $3.8 million for accelerated delivery.

Sacramento Regional Transit District: Placed a $14 million order with Siemens-Duewag for 10 additional 64-passenger, U2 model light rail vehicles. Siemens Energy & Automation, Inc., of Atlanta is the prime contractor. Siemens will supply the electrical equipment and Duewag will construct the cars. The order will bring Sacramento's fleet to 36 cars.

Southern Pacific: Placed an order with the Locomotive Group of General Motors for 50 four-axle, 3,800-hp, GP60 diesel-electric units at a total cost of more than $50 million. Delivery is scheduled for first quarter 1990.

- Placed a $15 million order with Gunderson for 325 100-ton, 3,200-cubic-foot capacity gondola cars for the transport of steel and steel products. Deliveries begin this month.

Facilities

City of Chicago: Awarded a $19.3 million contract to Union Switch & Signal for a complete train control system for the new 10-mile double-track line Chicago Transit Authority is building between downtown Chicago and Midway Airport. The line encompasses 14 interlockings. The project involves application of US&S's Microlok (vital) and Genisys (non-vital) microprocessor-based interlocking control equipment, as well as switch machines, signals, audio frequency track circuits, and train stops.

CSX Transportation: Is completing the installation of eight sets of No. 16 turnouts, each set consisting of 101 concrete ties supplied by Abetong-America, fastening systems supplied by Pandrol, and steel parts from Cogifer.

Revenue freight carloadings

Commodity	July 15 week	July 8 week	July 1 week	June 24 week	June 17 week
Grain	27,503	21,153	28,929	27,654	25,439
Other farm products	1,538	1,143	1,617	2,017	2,095
Metallic ores	26,309	22,016	23,673	23,222	22,590
Coal	91,365	75,022	96,197	113,070	121,969
Crushed stone, gravel and sand	17,742	12,494	17,104	17,128	16,586
Nonmetallic minerals	10,352	8,417	10,306	[illegible]	10,192
Grain mill products	9,795	8,549	10,154	9,860	9,877
Food and kindred products	8,599	7,140	8,555	8,379	8,638
Primary forest products	9,645	5,892	9,541	9,251	9,124
Lumber and wood products	6,421	4,365	7,598	7,337	6,838
Pulp, paper and allied products	10,551	10,368	10,891	10,463	10,568
Chemicals and allied products	26,098	24,267	26,593	24,978	25,701
Petroleum products	5,486	4,454	5,464	4,991	4,962
Stone, clay and glass products	11,084	8,729	10,657	10,195	10,438
Coke	5,050	4,949	5,408	5,244	5,456
Metals and products	8,709	7,315	10,465	9,812	9,256
Motor vehicles and equipment	10,254	9,644	17,400	19,628	20,556
Waste and scrap materials	8,159	5,585	8,551	8,482	9,126
All other carloads	6,945	4,801	7,647	6,999	7,028
Total Cars Loaded	301,895	246,383	316,948	329,386	336,461
% change from previous year	(9.6)	(9.9)	(3.0)	(5.7)	(3.2)

		% change
Cumulative total: 28 weeks	9,277,480	(.6)

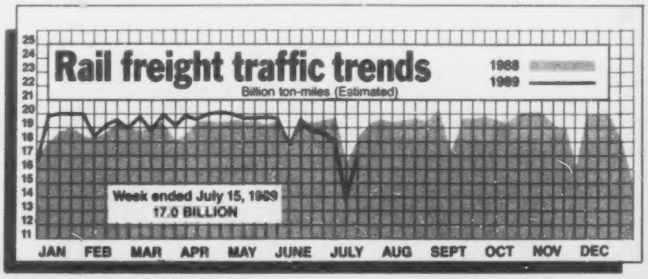
	July 15	July 8	July 1	June 24	June 17
Estimated revenue ton-miles (billions)	17.0	13.9	18.0	18.6	18.9
% change from previous year	(11.0)	(10.3)	(1.6)	(4.6)	(3.0)

Total:	1989	1988	% change
28 weeks	531.8	531.9	.0

Intermodal traffic

	July 15	July 8	July 1	June 24	June 17
Trailers	62,129	49,187	66,890	65,363	65,214
Containers	47,495	38,646	46,064	46,240	44,991
Total	**109,624**	**87,833**	**112,954**	**111,603**	**110,205**
% change from previous year	(1.1)	(12.9)	(5.2)	(3.2)	(2.8)

		% change
Cumulative total: 28 weeks	3,098,107	.0



Source: Association of American Railroads

Freight cars

	DELIVERED		ORDERED		ON ORDER AND UNDELIVERED	
	2nd quarter 1989	2nd quarter 1988	2nd quarter 1989	2nd quarter 1988	July 1 1989	July 1 1988
Built new by carbuilders	7,838	4,598	5,649	9,131	16,398*	17,225
Built new in RR shops	0	0	0	0	0	0
Built new—Total	7,838	4,598	5,649	9,131	16,398	17,225
Rebuilt	0	70	0	0	0	211
TOTAL	7,838	4,668	5,649	9,131	16,398	17,436
Locomotives (new and rebuilt)	288	408	N/A	N/A	146	126

*Adjusted for 1st quarter.

Source: Transportation Div., AAR and American Railway Car Institute

Profits drop as costs rise faster than revenues

Class I railroads posted a 1% increase in traffic volume in this year's first quarter, but per-ton-mile revenue climbed by only 0.5%. Meanwhile, operating expenses rose by 3.5%, and the net result was a 20% decline in railway operating income, from $556 million in first quarter '88 to $443 million this year.

William H. Dempsey, president of the Association of American Railroads, observed that "while railroads had regulatory freedom, under the Rail Cost Adjustment Factor, to increase rates by 3.8% during the first quarter of 1988, competition held those increases to 0.5%. The relatively small 0.5% actual gain in freight revenue per ton-mile is a reflection of the competitiveness of the transportation marketplace."

Ordinary income, which includes earnings from outside sources, was down 1.9% in the first quarter, from $517.4 million to $507.5 million.

CLASS I RAILROADS IN THE UNITED STATES

	First Quarter	
	1989 (millions)	1988 (millions)
Operating Revenues	$6,995.9	$6,878.9
Operating Expenses	6,265.1	6,051.2
Net Revenue from Operations		
United States	730.8	827.7
Eastern District	424.9	382.2
Western District	305.9	445.5
Ordinary Income		
United States	507.5	517.4
Eastern District	308.7	215.9
Western District	198.8	301.5
Net Railway Operating Income		
United States	442.7	555.7
Eastern District	257.6	249.5
Western District	185.1	306.1
Rate of Return on Net Investment*	5.15%	5.34%

*Defined as reported net railway operating income divided by average net property investment reduced by accumulated deferred tax credits.

For SP, Rio Grande: "Chicago at last"

Interstate Commerce Commission approval will be required, but the deal is done for Rio Grande Industries to buy 532 miles of railroad from Soo Line Corp., a line east from Kansas City that will give the RGI rail system entry to Chicago. Purchase price is $86 million, and it may be a bargain, considering that the RGI railroads are the only major western rail system without access to the Chicago gateway.

Said Mike Mohan, president of RGI's Southern Pacific and Rio Grande railroads: "We will reach Chicago at last. [That] has been a goal of our railroads for over a century. This will add new competitive force to our services, not just in the important Chicago market but, through Chicago, all across the nation."

Under the agreement, Soo Line would have trackage rights in order to serve all points on the Kansas City-Chicago line for traffic moving to or from its own rail system. The RGI railroads would get direct access to customers in Milwaukee and Dubuque, Iowa, through a haulage agreement with Soo Line, and Soo's Chicago yards would handle SP-Rio Grande trains.

Edwin V. Dodge, president and chief executive officer of Soo, said that the planned arrangement "recognizes the distinct marketing needs of each carrier. As the new owner, Southern Pacific will achieve its major objective to reach Chicago, while Soo will be able to offer its customers continued access to important markets on the line."

Santa Fe was the first of the so-called transcontinentals to run Chicago-West Coast on its own rails. Burlington Northern got access through merger of Great Northern, Northern Pacific and Chicago, Burlington & Quincy almost 20 years ago. Union Pacific got it more recently, through merger with Missouri Pacific, and UP also has a close working relationship with Chicago & North Western.

RGI is hoping for fast action on its application to the ICC. Said Mike Mohan: "This is a simple transaction that will enhance competition in the transportation marketplace. We believe there is good reason for the ICC to consider it on an expedited time schedule."

CR program guards shareholder rights

Conrail last month announced the establishment of a shareholder rights program—a dividend distribution of one common share purchase right for each outstanding share of Conrail common stock.

Conrail Chairman, President and CEO James A. Hagen said the plan is "designed to assure that all of Conrail's stockholders receive fair and equal treatment in the event of any proposed takeover of the company and to guard against the use of abusive tactics to gain control of the company without paying all shareholders a premium. [It] will not prevent a takeover of the company, but should encourage anyone seeking to acquire the company to negotiate with the board of directors prior to attempting a takeover." He added that the plan "is not being implemented in response to any particular takeover threat or proposal."

At the same time Conrail announced a dividend of 35 cents a share payable Sept. 15, a 17% increase over the 30 cents dividend paid June 15.

Conrail reported second quarter 1989 net income of $82 million, compared with $97 million in the corresponding 1988 period. First half 1989 income was $142 million, down from $145 million in 1988.

Hagen said that in view of lower than expected traffic and revenue levels, the railroad had implemented "a more aggressive cost control program" to achieve its 1989 income goals.

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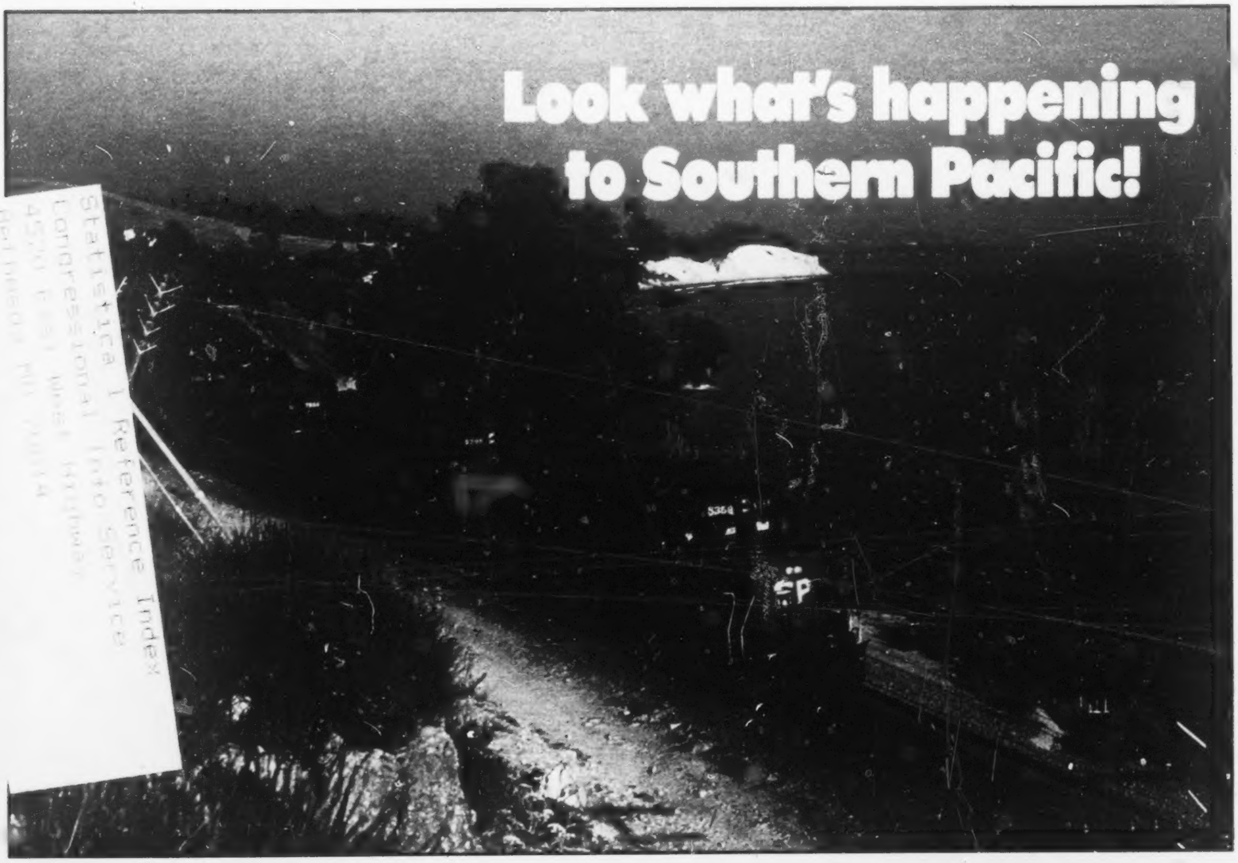

Look what's happening to Southern Pacific!

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What's new in detectors

Rail lubrication: The options

Is "turnkey" the key to lower transit costs?

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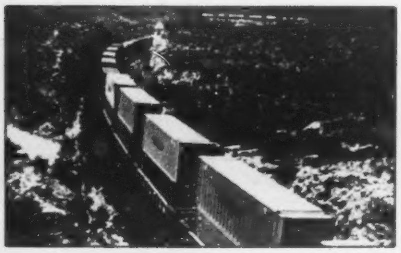

30 Look what's happening to SP!

With expanding routes, and an almost compulsive emphasis on service and quality, the "new" SP is reaching out to customers old and new, and they're responding.

35 Component suppliers: Faith, hope, R&D pay off

For those companies that not only survived depression conditions but continued to invest in product development, a stable market is starting to shape up.

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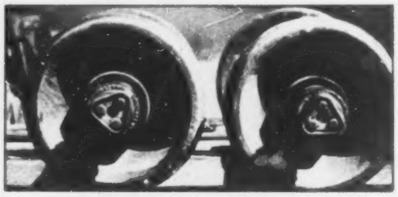
Onboard hotbox monitoring/detection devices are challenging acoustic detectors for attention as railroads continue to try to bring the bearing failure rate down.



49 Rail lubrication benefits multiply

Vehicle-mounted lubricators can sharply reduce wheel and curve rail wear as well as fuel consumption, according to a just-published AAR R&T Department report.

63 Opportunity knocks for Itel

Along with the Evans and Pullman Leasing car fleets, Itel acquired new shop capacity. It's now doing contract repairs and may enter the new-car business.

65 Time to talk "turnkey" transit?

Letting a single contractor or group of contractors plan, build, equip (and sometimes operate) a system saves time and money and helps attract private capital.

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Southern Pacific cover photo by Edward Delvers

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INSIDE

Where $1 will get you $13

LUTHER S. MILLER

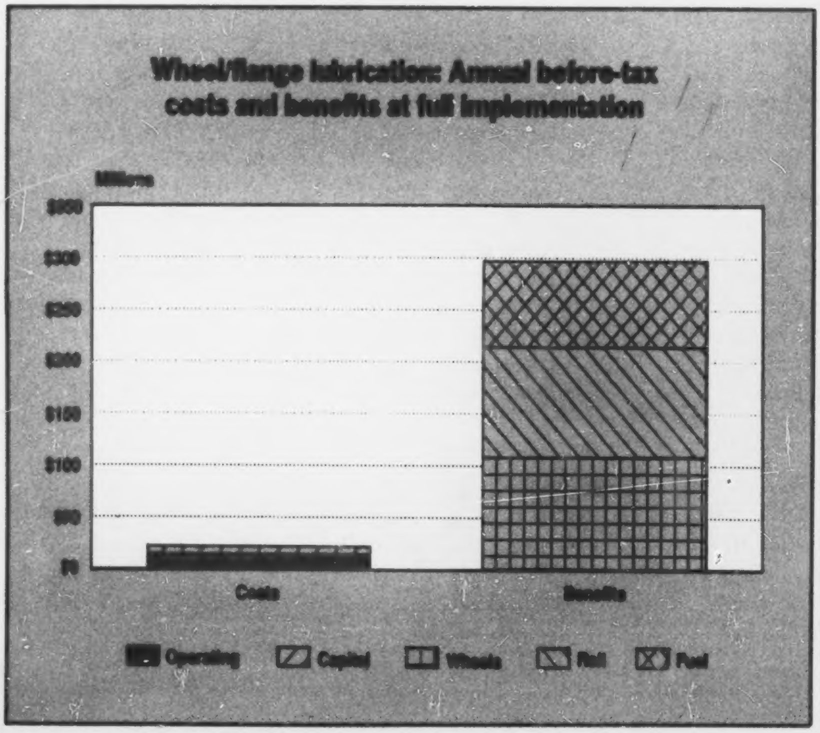
The cost-benefit analysis reproduced below is Exhibit 3 in the just-published AAR Research & Test Report R-729, and it goes a long way toward explaining why R-729 has in recent weeks become the talk of the industry.

What the chart says is that Class I railroads, once they are coating all of their principal tangent and curve rail with varying thicknesses of grease, will realize benefits of nearly $300 million a year for a total outlay of around $22 million a year.

Or to put it another way, as AAR chief engineering economist T.A. Gudiness does in R-729, "Economics of Wheel-Flange-to-Rail Lubrication of Tangent and Curve Track":

"Every dollar usefully spent on wheel-rail lubrication of tangent and curve track yields $13 in before tax benefits, $10 of which contribute to profits in the long run, and $3 of which (the fuel benefits) do so immediately. With that kind of operational leverage available, each railroad may wish to consider proceeding with large-scale implementation as soon as it has found a suitable lubricator."

There are, in fact, half a dozen or so lubricator options on the market, as well as a variety of lubricants designed to do the job but not overdo it. And some of the suppliers are doing a brisk business. By the end of this year railroads will have equipped around 5,700 road locomotives with lubricators (1,900 this year alone); at full implementation about 8,500 locomotives will have onboard lubricators. For the latest chapter in the story behind all of this, see p. 49.



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Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200
Fax: 212-633-1165
ARTHUR J. McGINNIS, Jr.,
President and Publisher
LUTHER S. MILLER, Editor

Publishing Director: Robert G. Lewis

Managing Editor: Judy McCusker
Intermodal Editor: Douglas John Bowen
Financial Editor: Anthony D. Kruglinski
Contributing Editors: John H. Armstrong,
William D. Middleton
Art Director: Maurice H. Mates
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Production Manager: Tina Small
Circulation Director: John Scunziano
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Western Editorial Offices
Chicago, Ill. 60604,
175 W. Jackson Boulevard, Suite A-1927
312/427-2729
Fax: 312-427-3014
GUS WELTY, Senior Editor
Engineering Editor: Robert E. Tuzik
Editorial Assistant: Wanda Welty
Contributing Editor: F. K. Plous

International Offices
Falmouth, Cornwall, TR11 4RJ, England
P.O. Box 8
Telephone: 44-326-313945
Fax: 011-44-326-319066
International Editors: Michael Knutton,
David Briginshaw

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Equipment

Burlington Northern: Will acquire 100 3,800-hp SD60 locomotives from the Electro-Motive Division of General Motors in an innovative deal which calls for the units to be maintained by BN shop employees working under EMD supervision.

Union Pacific: Will lease 550 4,300-cubic-foot-capacity aluminum rotary dump gondolas for movement of low-sulphur coal from the Powder River Basin of Wyoming. RESIDCO originated and structured the lease and arranged the lease financing for this $28 million, five-unit-coal-train package. The cars are being built by Bethlehem Steel.

Washington Metropolitan Area Transit Authority: AEG Westinghouse Transportation Systems will supply propulsion and automatic train control equipment for cars which Breda is building for WMATA. The contract calls for an initial 68 carsets of equipment to be delivered by June 1991 and includes a variable buy of 32 carsets with an option for an additional 40 carsets.

Facilities

Grand Trunk Western: Will expand and modernize its MoTerm intermodal facility at Detroit at a cost of $7.2 million. Phase 1, including removal of GTW's Ferndale yard, relocation of main line tracks, and expansion of the terminal's truck-parking area, will be completed in October. Phase 2, scheduled for completion a year later, will include construction of new gate facilities and fencing and lighting, and installation of new computer and telephone systems. The terminal will more than triple the daily throughput capacity of the existing facility.

Metra: Will spend $90 million over a four-year period to rehabilitate the trainshed of the Chicago & North Western passenger terminal near the Chicago Loop. Metra has also earmarked $250 million for a bridge replacement/rehabilitation program, a five-year project involving 90 structures.

Santa Fe: Will enlarge three tunnels near Martinez, Calif., to accommodate movement of domestic and international double-stack trains over its main line in northern California. Morrison-Knudsen is performing the work, at a cost of about $5 million, with completion scheduled for late-1989. M-K will raise (notch) the ceilings in two tunnels and lower the floor in the third. At the same time, Santa Fe will renew the track inside the tunnels, installing 16,600 feet of new 132-pound cwr, 5,200 crossties and more than 2,900 cubic feet of rock ballast, and rebuilding the drainage systems.
• Awarded a contract to Union Switch & Signal for a Dual Digital Control (DDC) system which will replace existing control equipment at Santa Fe's Argentine, Kans., yard. US&S describes the DDC system as a fully automated, real-time control package that increases reliability and reduces maintenance costs by integrating the class yard control equipment and subsystems, including retarders, switches, weigh rails, wheel detectors, Doppler radar units, and weather stations. The system monitors data from each component and compensates for stalled cars and for changes in car reliability, wind speed or direction, temperature, and switch or retarder operation.

Revenue freight carloadings

Commodity	Aug. 19 week	Aug. 12 week	Aug. 5 week	July 29 week	July 22 week
Grain	25,547	26,475	24,853	26,626	24,937
Other farm products	900	915	894	950	1,121
Metallic ores	20,827	21,068	21,660	20,471	23,604
Coal	132,554	130,234	120,282	121,802	111,930
Crushed stone, gravel and sand	16,962	17,435	17,757	16,894	17,302
Nonmetallic minerals	11,145	11,177	10,155	10,484	10,205
Grain mill products	9,692	9,533	10,000	9,467	9,796
Food and kindred products	8,918	9,019	9,050	9,144	8,757
Primary forest products	9,368	9,488	8,957	9,264	9,364
Lumber and wood products	6,607	6,271	6,601	7,078	6,803
Pulp, paper and allied products	9,961	10,184	10,615	10,620	10,544
Chemicals and allied products	27,150	26,927	27,278	26,305	27,242
Petroleum products	4,937	5,523	4,966	5,300	5,130
Stone, clay and glass products	11,074	11,172	10,737	10,935	10,506
Coke	5,152	5,486	5,986	5,760	5,507
Metals and products	8,368	8,947	9,429	9,654	9,501
Motor vehicles and equipment	17,571	16,241	13,950	13,914	12,858
Waste and scrap materials	8,308	8,086	7,686	8,285	8,390
All other carloads	6,921	6,465	6,475	7,081	7,228
Total Cars Loaded	**342,582**	**340,647**	**327,436**	**330,864**	**326,726**
% change from previous year	(2.8)	(.1)	(3.0)	(4.3)	(4.4)

		% change
Cumulative total: 33 weeks	10,938,480	(.9)

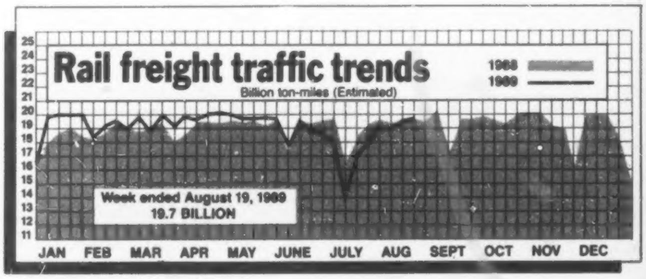
	Aug. 19	Aug. 12	Aug. 5	July 29	July 22
Estimated revenue ton-miles (billions)	19.7	19.5	18.9	19.0	18.2
% change from previous year	(2.0)	.0	(2.1)	(3.1)	(4.7)

Total:	1989	1988	% change
33 weeks	627.1	629.5	(.4)

Intermodal traffic

	Aug. 19	Aug. 12	Aug. 5	July 29	July 22
Trailers	64,570	64,262	65,265	66,594	64,577
Containers	51,511	49,437	49,479	51,022	48,239
Total	**116,081**	**113,699**	**114,744**	**117,616**	**112,816**
% change from previous year	.9	.9	1.1	3.7	(.3)

		% change
Cumulative total: 33 weeks	3,703,546	3.3



Source: Association of American Railroads

WATCHING WASHINGTON

Mr. Bush, meet the railroads

In its quest for new energy and clean-air policies, the Bush Administration is finally starting to get its act together. But so far the railroads are missing from the cast, despite numerous studies that have underscored their effectiveness in conserving energy and protecting the environment.

Energy conservation is high on the Administration's priority list, and well it should be: Imports now account for nearly half of our oil supply, more than at the time of the Arab oil embargo in 1973; and the experts are saying that the price is rising.

Interior Secretary Manuel Lujan, Jr., doubtless had this on his mind when he traveled to Long Beach, Calif., a few weeks ago to tell the Western Governors Association about the Administration's search for "a sensible, long-term energy strategy."

Secretary Lujan said it's "important that we develop alternate sources for powering our automobiles—natural gas, methanol, ethanol and electricity." But nowhere did he mention the demonstrated effectiveness of passenger rail—intercity, commuter, rapid transit, light rail—in reducing dependence on the automobile.

(Perhaps he was embarrassed to bring the matter up: It is this Administration, after all, that has proposed cutting federal aid to mass transit in half, and drastically reducing aid to Amtrak.)

Secretary Lujan also mentioned that "fully two-thirds of all of our oil use goes to fuel our transportation system"—but nowhere did he mention the relative efficiency with which the various modes use that oil.

The following breakdown comes not from the Department of the Interior but from Jack Brannan, the Pittsburgh-based transportation consultant (and former chief mechanical officer of the Long Island Rail Road), who has campaigned long and tirelessly against the sacrifice of our energy resources at the shrine of the internal combustion engine.

U.S. Oil Consumption	
Private automobile	43%
Airline industry	8%
Interstate motor truck	8%
Interstate railroads	2%
Inland waterways	1%
Pipe lines	1%
Other transport	3%
Subtotal transportation	**66%**

(To which Mr. Brannan adds the parenthetical note that railroads use one-fourth of the diesel fuel to haul the same tonnage as trucks.)

Meanwhile, back at the White House, President Bush unveiled a clean-air plan which, to the disappointment of the National Association of Railroad Passengers, "failed to call for reduced auto use and increased reliance on mass transit and transit-supportive land-use planning."

"The Bush transportation proposals," grumbled NARP, "rely almost exclusively on improved emissions performance by individual cars."

Over at the Department of Transportation, another search is under way—for a national transportation policy. Rail advocates, freight and passenger, are having their say at a number of hearings DOT is holding on this subject. They're hoping their message will trickle over to Interior and, if such a thing is possible, up to the White House.—**L.S.M.**

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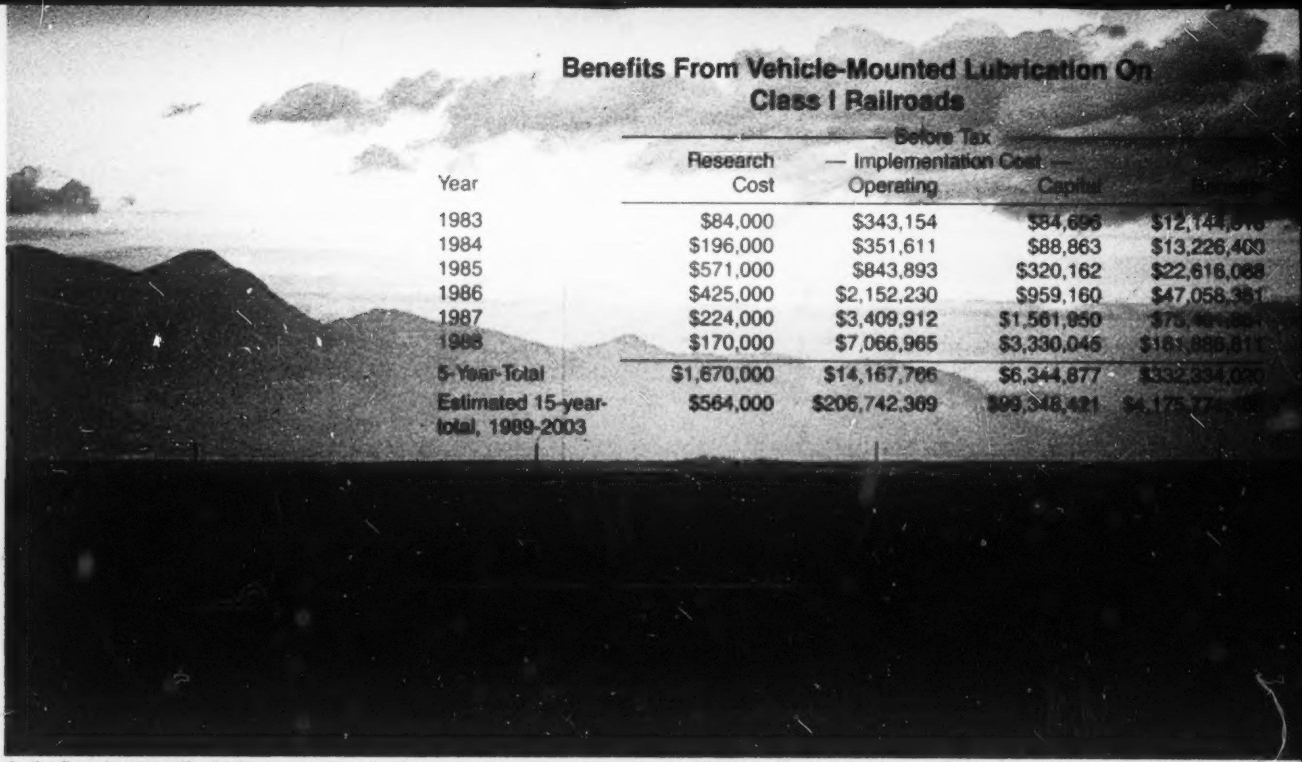

Benefits From Vehicle-Mounted Lubrication On Class I Railroads

Year	Research Cost	Before Tax — Implementation Cost — Operating	Capital	Benefits
1983	$84,000	$343,154	$84,696	$12,144,[illegible]
1984	$196,000	$351,611	$88,863	$13,226,400
1985	$571,000	$843,893	$320,162	$22,616,068
1986	$425,000	$2,152,230	$959,160	$47,058,361
1987	$224,000	$3,409,912	$1,561,950	$75,[illegible]
1988	$170,000	$7,066,965	$3,330,046	$181,886,811
5-Year-Total	$1,670,000	$14,167,766	$6,344,877	$332,334,020
Estimated 15-year-total, 1989-2003	$564,000	$206,742,369	$99,348,421	$4,175,774,[illegible]

In the first six years of vehicle-mounted lubrication, railroads achieved a payback of $332 million in return for research, operating, and capital outlays totaling $22 million, an AAR study indicates. Over the 15-year period 1989-2003, benefits exceeding $4 billion for outlays of slightly over $300 million are projected. Photo shows Conrail lubrication test train on Wheel/Rail Mechanism (WRM) Loop at Pueblo.

Rail greasing:

Big new savings identified

Significantly reduced wheel and curve rail wear, as well as lower fuel consumption, could result in a payback of $13 for every $1 invested in onboard lubrication, says an AAR study.

By LUTHER S. MILLER, Editor

Because of an "accidental and astounding" discovery made at a test track in Pueblo, Col., six years ago, the railroads over the next 15 years stand to reap benefits of $4 billion for an outlay of $300 million—a return-on-investment of a magnitude not seen since the mid-century switchover from steam power to diesels.

That is the eye-popping bottom line of AAR Research and Test Report R-729, "Economics of Wheel-Flange-to-Rail Lubrication of Tangent and Curve Track." It's a 66-page document full of surprises even for those who have been close to the fast-unfolding wheel/rail lubrication story.

The "accidental and astounding" discovery made at Pueblo in 1983 is by now a thrice-told tale. Wrapping up a five-year series of Rail Metallurgy Experiments (RME) at the AAR's Transportation Test Center, researchers stumbled upon the finding that trains traveling on lightly-greased rails consumed substantially less fuel than trains traveling on dry rails.

Up to that time rail lubrication was essentially confined to curves, and many of the mechanical wayside lubricators that were assigned to the task had been allowed to fall into disrepair. Now, the astounding news from Pueblo was that grease could not only reduce rail wear on curves but could also save energy on tangent track.

Field tests confirmed these findings, and response was swift on both the demand and supply sides.

Old and new lubrication-system manufacturers went to their drawing boards, and very soon brand names like TSM, Kipp KLS, Lubriquip, Willy Vogel, Bijur, and Fuji began to appear in product literature that offered an array of onboard greasing devices ranging from the simple to the sophisticated, including systems equipped with electronic sensors to increase the flow of lubricant on curves. (There was also renewed interest in wayside curve lubricators, and both Moore & Steele and Portec began to market sophisticated new equipment, using such terms as "hydraulic" and "solar-powered" to describe state-of-the-art devices far removed from the old mechanical lubricators.)

By the end of 1988, Class I railroads had equipped 3,800 road freight locomotives with wheel/flange lubricators; they will equip another 1,900 units this year, and the total is expected to reach 8,500 at full implementation in the 1990s. A few railroads are using hi-rail-mounted lubricators; 27 of these were in service at the end of 1988.

The main impetus has so far been fuel savings. Now—and this is the big surprise in R-729—the evidence strongly suggests that onboard lubrication will produce even bigger savings in freight-car and locomotive wheel replacements and in curve rail wear.

"At full implementation," projects R-729, "wheel/rail lubrication of tangent and curve track will produce annual savings of $83 million in fuel, $108 million in freight car and locomotive wheels, and $104 million in curve rail—a total of $295 million a year."

The implications of this are very clear, in the view of the author of the R-729 report, AAR chief engineering economist T.A. Gudiness:

"Every dollar usefully spent on wheel/rail lubrication of tangent and curve track yields $13 in before tax benefits, $10 of which contribute to profits in the long run, and $3 of which (the fuel benefits) do so immediately. With that kind of operational leverage available, each railroad may wish to consider proceeding with large-scale implementation as soon as it has found a suitable lubricator."

To date, according to the AAR study, which was published last month, about $1.7 million has been spent on research, $14.2 million on operating costs, and $6.3 million on capital costs. Between 1989 and 2003 research costs will drop to around $560,000, with operating costs totaling $206.7 million and capital costs, $99.3 million.

All of this has, of course, stirred up new interest in lubricants. As the search for an "optimum" lubricant goes on, a variety of products are on the market. Railroads spent $2.9 million on lubricant in 1988; this will rise to an estimated $5.9 million a year at full implementation.

These are the components of one of the two best-selling flange lubricating systems, the Kipp KLS (recently acquired by the company that also owns Lubriquip). The other leading supplier of onboard systems is TSM.

• Caveats and cautions. The R-729 document, which is studded with tables and graphs charting the actual and probable results of wheel/rail lubrication, comes with its share of caveats. Some of the input, the author points out, came from judgmental statements by railroad people interviewed for the study; it was impossible to check out all of the sources and assumptions which lay behind much of the data; and some data came from proprietary tests and could not be independently checked.

Gudiness also takes note of "the difficulty of separating out the physical and economic effects of parallel technological advances." For example: "How much savings in wheel and rail could be ascribed to tangent track lubrication versus parallel developments such as better attention to wayside lubrication, introduction of profile rail grinding, development of better wheel/rail lubricants, adoption of better metallurgy and improvements in train handling techniques?

"We did the best we could," says Gudiness, "to separate tangent track lubrication savings from other savings, but undoubtedly some economic benefits from parallel innovations were inevitably mixed up with the savings ascribed to the topic at hand."

Keeping these caveats in mind, here are some of the highlights of R-729:

Fuel savings: At full implementation, vehicle-mounted lubrication will save Class I railroads about 140 million gallons of diesel fuel per year. Railroads using locomotive-mounted lubricators may expect to

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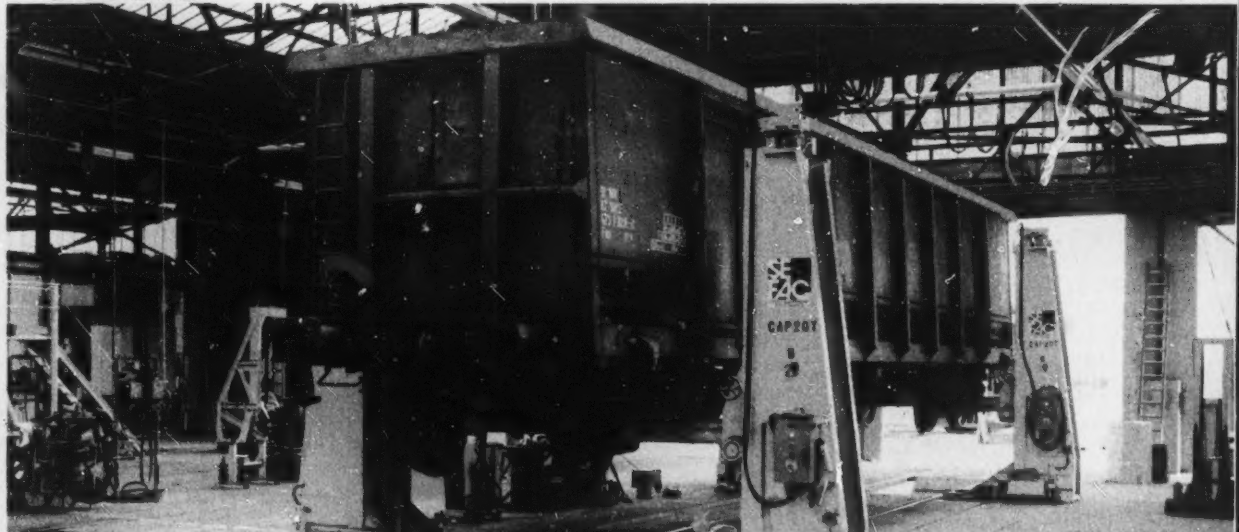

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reduce fuel costs by about 5.5% beyond what they achieved with mechanical wayside lubricators. Railroads using hi-rail-mounted lubrication may achieve only a 3% saving. This is because "locomotive-mounted lubrication is easier to control because the lubricant is deposited on the rails by nearly every train that passes. Each train would see about 5.5% in fuel savings because nearly every train provides its own wheel/rail lubrication. But, hi-rail-mounted lubrication tests at FAST have shown that only the first few trains that followed the hi-rail lubricator truck might see a 5.5% fuel savings. Subsequent trains would see less of a fuel savings as the lubricant wore off."

Wheel savings: Available evidence suggests that at full implementation railroads using locomotive-mounted lubricators will save about 30% on freight car wheel replacements and about 50% on locomotive wheel truings and replacements. "Class I railroads could expect to save $56 million on car and locomotive wheels in 1988, because of vehicle-mounted lubrication, $100 million in 1993 and $108 million in 2003."

Freight car wheel savings are expected to reach $46 million in 1988, $82 million in 1993, and $88 million in 2003. These savings are calculated using a typical cost of about $1,000 to replace a freight car wheelset.

The AAR study arrived at the car-wheel savings estimate this way: "We used 350,000 miles as the life of freight car wheels, before the introduction of vehicle-mounted lubrication. This figure was supplied by one of the major railroads. The same railroad, which now uses locomotive-mounted lubricators in large numbers, claimed that preliminary results from a study they were doing indicated that they were using at least 30% fewer freight car wheelsets in territory where locomotive-mounted lubricators had been fully implemented, compared to the period immediately preceding implementation. This was after adjustment had been made for differences in gross ton-miles for the years used in the comparison." The AAR study estimates that vehicle-mounted lubrication adds 75,000 miles to the life of a car wheel.

Savings on locomotive wheels are estimated at $10 million in 1988, $18 million in 1993, and $20 million in 2003, due to a reduction in both wheel replacements and wheel truings. This is based on an estimated cost of $2,200 for replacing a locomotive wheelset ($2,040 for shop costs and $160 as the cost of tying up a locomotive while a wheel set is replaced). Wheel truing savings should amount to $1.1 million in 1988, $2.1 million in 1993, and $2.2 million in 2003, based on a cost of $111 per wheel for truing ($83 for shop cost, $28 for tying up a locomotive unit).

Curve rail savings: "To date, there appears to be no convincing evidence that wheel-mounted lubrication is producing increased tangent rail life," says R-729. "Indeed, both before and after the introduction of rail lubrication, tangent rail almost always failed because of fatigue or vertical head wear, rather than gauge-face wear.

"[But] railroads could expect to achieve curve rail savings of $57 million in 1988, $97 million in 1993, and $104 million in 2003. Curve rail savings were similar in magnitude to those for wheels and significantly larger than expected fuel savings."

According to the AAR study, "Class I railroads spent about $184 million per year to replace curve rail prior to the implementation of vehicle-mounted lubrication, and they could expect to spend about $77 million a year after full implementa-

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tion....Class I railroads were using around 940 track-miles of curve rail a year prior to the introduction of vehicle-mounted lubrication...and expect to use around 400 track miles per year after full implementation." This assumes that use of locomotive-mounted lubricators will improve the life of premium curve rail by about 150%.

Wayside lubricator savings: To what extent can vehicle-mounted lubricators replace wayside lubricators? Opinion is divided. This is what R-729 has to say:

"One railroad, with a lot of curvy track on part of its line, permanently discontinued maintenance of its wayside lubricators as part of an economy drive, more than a decade ago. When heavy-axle-load unit train traffic grew at a rapid pace in the 1980s, this carrier began to notice that wheels and rail were disappearing at an alarming rate. However, rather than return to wayside lubrication, it adopted locomotive-mounted lubrication, supplemented by hi-rail-mounted curve rail lubrication. This lubrication strategy has been fully operational for several years now, and the carrier is very pleased with the results.

"Another railroad, which is well along in the process of implementing locomotive-mounted lubrication, has not eliminated any of its mechanical wayside lubricators, but it has relocated some of them from medium-density, average-axle-load lines and concentrated them on high-density, heavy-axle-load lines. This strategy, combined with profile rail grinding, has doubled curve rail life on both medium- and high-density lines.

"Three other railroads have actually eliminated 335 mechanical wayside lubricators through 1988, as a direct consequence of implementing vehicle-mounted lubrication. They plan to eliminate 165 additional mechanical wayside lubricators in 1989 and 1990."

Research costs: The AAR research effort on rail lubrication cost the industry $1.7 million before taxes from 1983 to 1988, ($1 million after taxes)—a cost that "was recouped a hundred times over in the single year 1988," says R-729 author Gudiness.

The latest five-year plan calls for AAR research expenditures or projects related to wheel/rail lubrication to drop to $560,000 before taxes ($320,000 after taxes). Future projects will evaluate the effectiveness of different lubricants (1990 to 1993), develop laboratory tests for the evaluation of lubricants (1989 to 1991), field test the improved tribometer for measuring wheel wear (1989 to 1991), determine the optimal rates for applying different kinds of lubricant under various conditions (1989 to 1992), and determine the effects of sanding on wheel/rail lubricant (1990).

Lubricant: Railroads used about 500,000 gallons of lubricant in locomotive-mounted systems in 1988; this is expected to rise to 1.1 million gallons by 1993 and 1.2 million gallons in 2003. Average cost is about $4.70 per gallon.

For antitrust reasons, the AAR report was unable to discuss lubricants by brand name, but a few surveyed roads were able to supply generic descriptions. Two were using a graphite-based lubricant, one was using 30% graphite, and one used a graphite-molybydenum suspension.

(AAR Research and Test Department Report R-729 is available from the Document Distribution Center, Chicago Technical Center, 3140 South Federal St., Chicago, Ill. 60616. The cost to AAR non-members is $100.)

- **What Conrail found.** Individual railroads have been conducting their own re-

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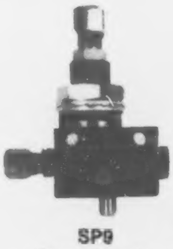

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search into the potential of onboard lubrication. In recent months, Conrail conducted two such tests at Pueblo. Douglas B. Tharp of Conrail's Technical Services Laboratory discussed the results of these tests with *Railway Age:*

"The purpose of the first test was to determine (1) if there was a significant improvement by using a lubricant with additives and some solids, in addition to tackifiers, and also to see if curve sensing was all it was cracked up to be. This was a joint Conrail-AAR test. We took our own locomotive and test car out to Pueblo with our onboard lubrication system with curve-sensing equipment, a modified Willy Vogel system. We tested nine different lubricants, including the one we're currently using. In almost all cases the other lubricants performed better than the lubricant we have been using, a calcium base without any additives or tackifier. We saw some significant improvements both with the premium lubricants and with curve sensing. As a result, we are going to discontinue the use of our calcium base and we're planning to go to a lithium base with a molybdenum disulfide solid and with a tackifier. We are also asking General Electric to install curve sensing equipment on 100 new locomotives we are buying in 1990."

New on the wayside lubricator market is Portec Railway Maintenance Products Division's Solar Protector, a battery-operated, solar-powered DC electronic lubricator intended for use at locations where AC power is not practical.

Conrail's other test, conducted in June, was designed to determine to what degree, if any, onboard lubricators could replace wayside lubricators. The results were inconclusive. "However," said Tharp, "after some further, real-world tests, I'm hopeful that we will be able to replace some wayside lubricators. The potential seems to be there on curves up to six degrees, which is what we tested at Pueblo."

As for the AAR report, Tharp observed, "If it's even close to being correct, what it says about wheel and rail wear in addition to energy savings is of the greatest importance.

"Even though we've been looking into it for five or six years," Tharp added, "this whole business of lubrication is still in its infancy and we will continue our research." To assist in that research, Conrail is buying, for around $10,000 apiece, two of the tribometers mentioned in the AAR report. These are devices which measure friction. Developed by British Rail, the tribometer technology was acquired by the AAR.

- **The Santa Fe experience.** Another railroad that has studied replacing wayside with onboard units is the Santa Fe. "We had hoped that we would be able to do away with the trackside lubricating systems when we first started the onboard program," said Santa Fe's chief mechanical officer, Doug Sizemore, "but I'm not sure that everyone shares that view at this time. There's a different weight of lubricant used in the wayside systems as opposed to what we carry on board the locomotive. We use different types of greases. I believe that some of the lubrication systems may not be capable of

(Continued on p. 90)

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Railgreasing

(Continued from p. 60)

delivering the greases with the higher viscosity. If you plan to replace a wayside lubricator, you have to be careful when you purchase an onboard system that it's capable of delivering the right lubricant."

If Sizemore has any advice for newcomers to onboard lubrication, it's this: "Buying the flange lubricator and putting it on is just the beginning of the program.

"The real problem," he added, "is making sure that the flange lubricator reservoirs are full and that the system is on and working. Like any other good program, it's going to take a lot of follow-up and a lot of control to make that happen."

Reliability is, in fact, an industry-wide problem, and it's one that railroads tend to blame not on the equipment but on their own maintenance practices.

W. E. Mims, general manager of environmental and engineering operations for CSX Transportation, said a spot survey of lubricators on his railroad a few months ago showed that "something in the neighborhood of about 40% had some small or major problem—they were not operative or were not operating as well as they should have been.

"Since then," said Mims, "we've put out videotapes that have stressed the importance of maintaining these things. One of the chief complaints I hear is that they're out of grease. Another problem is nozzles out of alignment. That's something we can correct very easily, and we are doing so."

- **How many lubricators?** Opinion varies as to what percentage of a locomotive fleet needs to be equipped with lubricators to get the maximum benefits, though 50% is a commonly cited number. Santa Fe, for example, plans to equip around half of its fleet of 1,550 locomotives.

This is Santa Fe's thinking on the subject, as summed up by Doug Sizemore:

"On the Santa Fe we have the eight-event locomotive recorder system on even numbered locomotives, so for maintenance and follow-up purposes we decided to put the flange lubricators on the even-numbered units. From past experience we knew that this gave us a probability in the 90% range that any consist running on our railroad would have at least one unit with a flange lubricator on that consist. But we have now modified that somewhat. We have some four-axle high-horsepower locomotives in transcontinental expedited piggyback service that are averaging 20,000 miles per locomotive per month. We have some other locomotives that are in heavy drag service averaging just about 12,000 miles a month. So we asked ourselves, why not put flange lubricators on those racehorses between Chicago and the Coast where we're using up all of that horsepower? Now, we are equipping all of the high-horsepower four-axle units because that's where we get the most benefit.

"What this really says is that you need to custom-fit the lubrication system to your particular circumstances. We're putting our lubricators where we're seeing the greatest amount of wear and using the most fuel."

Sizemore agrees with the AAR researchers that onboard lubrication is producing benefits undreamed of just a few years ago. One that particularly interests him: "We found that lubrication reduces the propensity to oscillate and truck-hunt, and we believe this will reduce derailments due to hunting."

The benefits to be derived from squirting a little grease on the rails may not be endless, but it sometimes seems that way. ■

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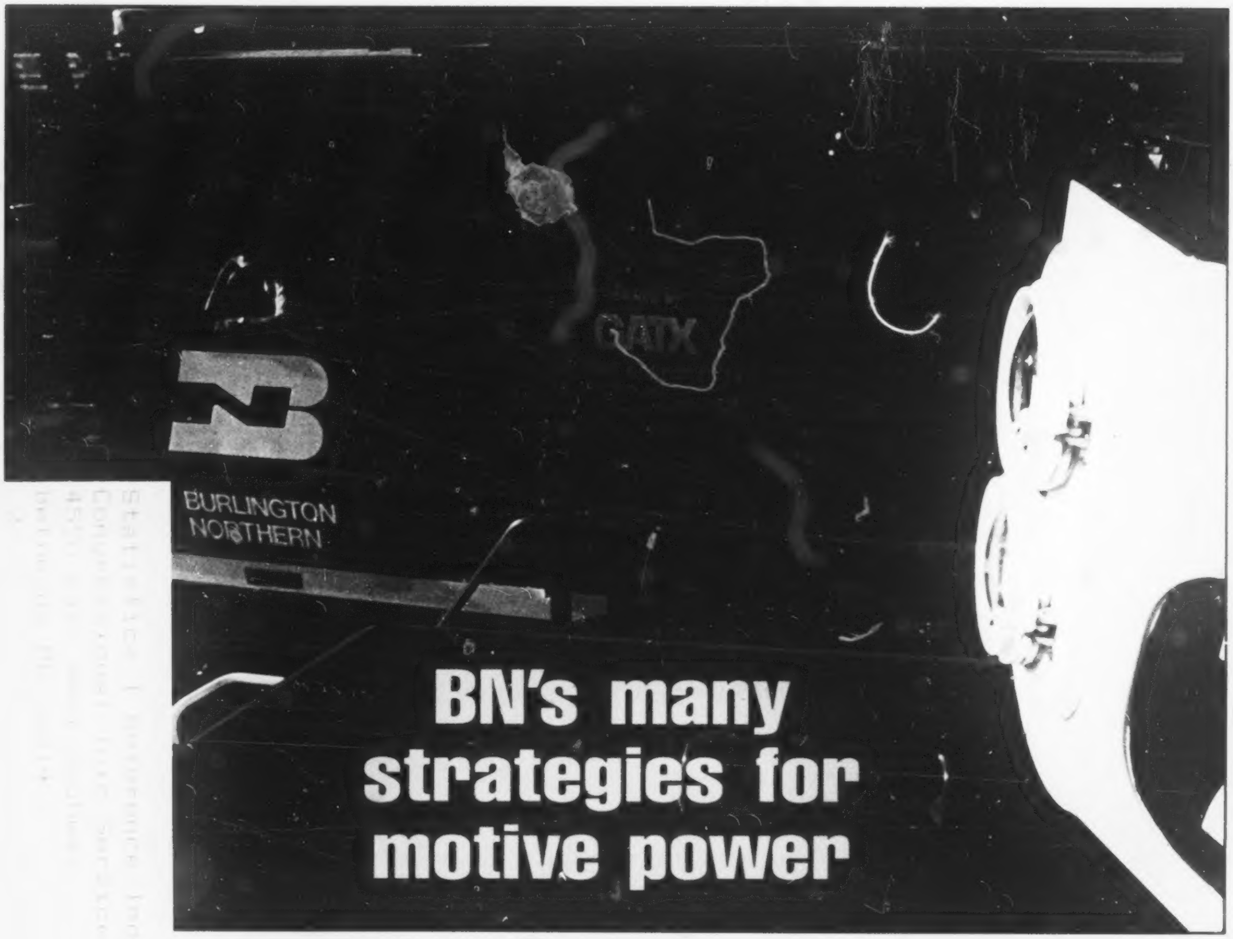
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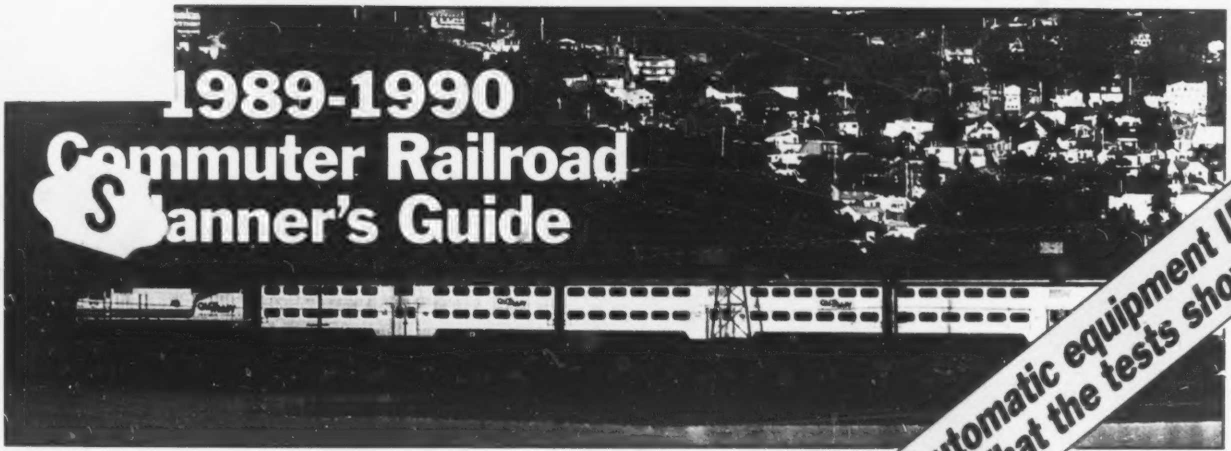
BN's many strategies for motive power



1989-1990 Commuter Railroad Planner's Guide

Automatic equipment ID: What the tests show

October 1989

Railway Age

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Features

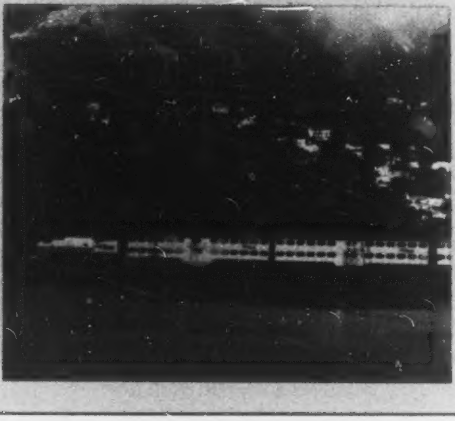
1989-90 COMMUTER RAILROAD PLANNER'S GUIDE

California looks to rail....CG3

The Golden State continues to seek solutions to traffic congestion in various forms of passenger railroading. The emphasis now is on commuter and regional systems.

Who's who on the supply side....CG8

A cross-indexed directory of companies—equipment/materials/services suppliers and consultants—with expertise in commuter railroading.



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INSIDE

California shows the way—the rail way

LUTHER S. MILLER

California's reputation as the land of the freak and the home of the knave is one of those generalizations that are best taken, in the words of Samuel Goldwyn, with a dose of salts—at least where public transportation is concerned.

Maybe California did freak out on highways, once. Maybe California has had more than its share of enthusiasts promoting "tomorrow's transportation" before today's was given a fighting chance.

But California years ago rejected the notion that monorail, for example, was a sensible substitute for conventional rapid or light rail transit. And while listening politely to the blandishments of maglev promoters, with their visions of trains floating over the countryside at 300 mph, California appears to have concluded that just as you have to crawl before you walk, and walk before you run, so must you run before you levitate—and what's running best and fastest all over the world today is the steel-wheeled train on steel rails. Evidence of this down-to-earth thinking is found in the remarkable partnership which California has forged with Amtrak in creating one of the finest intercity passenger rail systems to be found in any state. And there's more.

The postwar rail transit renaissance began in San Francisco, with the building of BART and the upgrading of the Muni lines into a modern light rail system. What really put light rail on the map, however, was the phenomenal success of the San Diego Trolley, which has been expanding, by popular demand, almost since the day it went into service. Sacramento and San Jose subsequently went the light rail route. Los Angeles, after nearly choking on a diet of concrete spaghetti, is simultaneously building phase I of a rapid transit system and two connecting light rail lines.

Commuter trains? They're also making news in California, as Contributing Editor William D. Middleton reports in *Railway Age's* 1989-90 Commuter Railroad Planner's Guide, a pull-out section in this issue.

Is there a place for such concepts as maglev and monrail? Yes. That place right now seems to be airports and amusement parks and perhaps other limited operation applications. Meanwhile, those who are so vigorously pushing maglev as a solution to our intercity transportation needs might do well to note that the two countries which have pioneered in the development of maglev—West Germany and Japan—have not been quick to apply it themselves. "Is Maglev Losing Its Attraction?" is the suggestive title of an editorial in the September *International Railway Journal*, in which Editor Mike Knutton reports that a senior official of the West German Ministry of Transport has said that a maglev line "will almost certainly never be built in West Germany." And according to the magazine *New Scientist*, a long-distance maglev in Japan may be 20 years away.

As for monorail, Germany has had a small one in operation for many years—*one.* Rapid transit and light rail are Germany's urban systems of choice.

A new system that does hold promise is Larry K. Edwards' "System 21" monobeam concept (*RA*, Aug., p. 28)—but it's being promoted not as a replacement for large rapid transit systems but as a feeder to them, or for other light-to-medium density purposes.

It's said that there's a time and a place for everything. Knowing the time—and the place—is the secret of sound transportation planning.

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Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200
Fax: 212-633-1165

ARTHUR J. McGINNIS, Jr.,
President and Publisher
LUTHER S. MILLER, Editor

Publishing Director: Robert G. Lewis

Managing Editor: Judy McCusker
Railway Division Manager: Carolyn McGinnis
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Contributing Editors: John H. Armstrong,
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Circulation Director: John Scunziano
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Western Editorial Offices
Chicago, Ill. 60604,
175 W. Jackson Boulevard, Suite A-1927
312/427-2729
Fax: 312-427-3014

GUS WELTY, Senior Editor
Engineering Editor: Robert E. Tuzik
Editorial Assistant: Wanda Welty
Contributing Editors: Bill Fahrenwald
Frank Malone

International Offices
Falmouth, Cornwall, TR11 4RJ, England
P.O. Box 8
Telephone: 44-326-313945
Fax: 011-44-326-319066

International Editors: Michael Knutton,
David Briginshaw

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Equipment

CSL Intermodal: Is leasing from Trailer Train 100 all-purpose articulated intermodal flatcars capable of carrying intermodal trailers and containers of varying sizes. Delivery began in September.

Itel Containers International: Awarded a $17 million contract to AmeriContainer for 5,000 TEU (20-foot equivalent units)—"the first volume container contract awarded to an American manufacturer in many years," according to the builder. AmeriContainer has converted a former Pullman-Standard freight car plant at Hammond, Ind., for the manufacture of containers (*RA*, Aug., p. 7). The contract with Itel calls for the design and manufacture of both 20-foot and 40-foot ISO dry vans as well as the new, lightweight, 48-foot domestic container designed as a joint project by ITEL/Container Concepts, Inc. Construction of the Itel order is to begin in February 1990.

Itel Rail: Is expanding its car leasing operations into Mexico through an investment by parent Itel Corp. in Mexico City-based Quadrum, which through its subsidiary Endasa operates a lease fleet of 1,700 hopper cars, 450 tank cars, and 350 boxcars. Itel purchased 35% of the outstanding shares of Quadrum, with the option of extending its ownership to more than 50%, and will make additional investments in the Mexican company. Quadrum operates a rail car repair and construction facility in Durango, Mexico. Itel operates North America's largest independent car leasing fleet, 72,000 cars.

XTRA Rail/Intermodal Division: Is acquiring 900 dry van intermodal trailers and 500 containers at a cost of more than $18.5 million. Monon will supply 400 of the trailers and all of the containers. Miller will supply 500 trailers. Deliveries are to be completed in November. All of the new units will be 48 feet long and 102 inches wide. The new containers will be added to XTRA's domestic container per diem leasing fleet. XTRA also said it will eliminate all 40-foot per diem trailers and substantially reduce its fleet of 45-foot, 96-inch-wide trailers as the larger equipment is phased in.

Taipei: Will acquire 132 rapid transit cars, at a cost of $170 million, from United Rail Car, a subsidiary of Nissho Iwai American Corp. and Kawasaki, which will build the cars at its Yonkers, N.Y., plant.

Revenue freight carloadings

Commodity	Sept. 16 week	Sept. 9 week	Sept. 2 week	Aug. 26 week
Grain	25,172	21,384	26,671	25,980
Other farm products	1,353	888	1,040	946
Metallic ores	20,936	20,246	21,317	20,392
Coal	130,367	119,748	133,827	132,806
Crushed stone, gravel and sand	18,232	14,752	18,123	17,498
Nonmetallic minerals	9,545	8,800	10,302	10,149
Grain mill products	9,909	8,830	10,280	10,144
Food and kindred products	8,411	7,712	9,075	8,797
Primary forest products	9,441	8,035	9,447	9,312
Lumber and wood products	6,357	5,016	6,822	6,813
Pulp, paper and allied products	10,198	10,290	10,875	10,630
Chemicals and allied products	26,873	24,804	29,313	27,345
Petroleum products	5,365	4,851	5,244	5,298
Stone, clay and glass products	11,482	9,637	10,982	10,825
Coke	5,546	5,449	5,385	5,406
Metals and products	9,235	7,879	10,709	9,645
Motor vehicles and equipment	18,041	14,772	17,400	18,114
Waste and scrap materials	8,936	6,595	8,311	8,302
All other carloads	7,489	5,856	7,025	7,700
Total Cars Loaded	**343,488**	**305,544**	**352,148**	**346,102**
% change from previous year	(3.6)	(1.3)	.0	.7

		% change
Cumulative total: 37 weeks	12,284,084	(1.0)

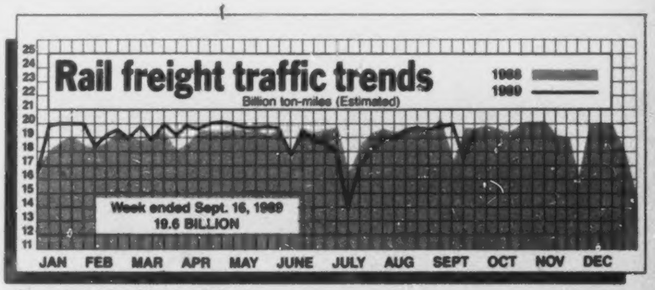
	Sept. 16	Sept. 9	Sept. 2	Aug. 26
Estimated revenue ton-miles (billions)	19.6	17.4	20.0	19.8
% change from previous year	(3.0)	(1.1)	.0	1.5

Total:	1989	1988	% change
37 weeks	705.6	705.8	.0

Intermodal traffic

	Sept. 16	Sept. 9	Sept. 2	August 26
Trailers	69,924	56,978	73,107	63,918
Containers	51,178	42,047	50,640	51,432
Total	**121,102**	**99,025**	**123,747**	**115,350**
% change from previous year	2.9	(1.8)	3.9	(1.2)

		% change
Cumulative total: 37 weeks	4,163,421	3.1



Source: Association of American Railroads

Facilities

BC Rail: Is investing $4 million (Canadian) in improvements to its North Vancouver yards to accommodate increases in lumber reloads and intermodal as well as general carload traffic.

French National Railways: Awarded a contract to a French subsidiary of Amtech of Dallas, Tex., for development of an automatic vehicle identification (AVI) system that is to be tested beginning in 1990 on the Marseille-Lille line and, if successful, installed system-wide over the next five years. The SNCF-Amtech system will be a strong candidate for designation as the European standard by the International Union of Railways (UIC), according to Philippe Larue, Amtech's vice president for international marketing. The Amtech technology was the basis for approval earlier this year by the AAR and by the International Standards Organization of proposed standards for railcars in the U.S. and Canada and intermodal containers world-wide.